OCTOBER, 1953

Products finishing

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Finishes on *Metal* Products

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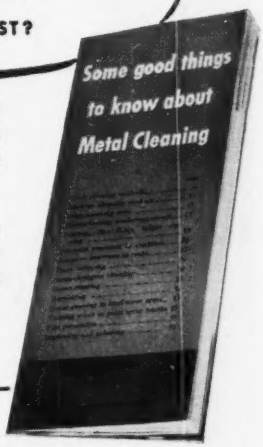
AT LOWER COST?



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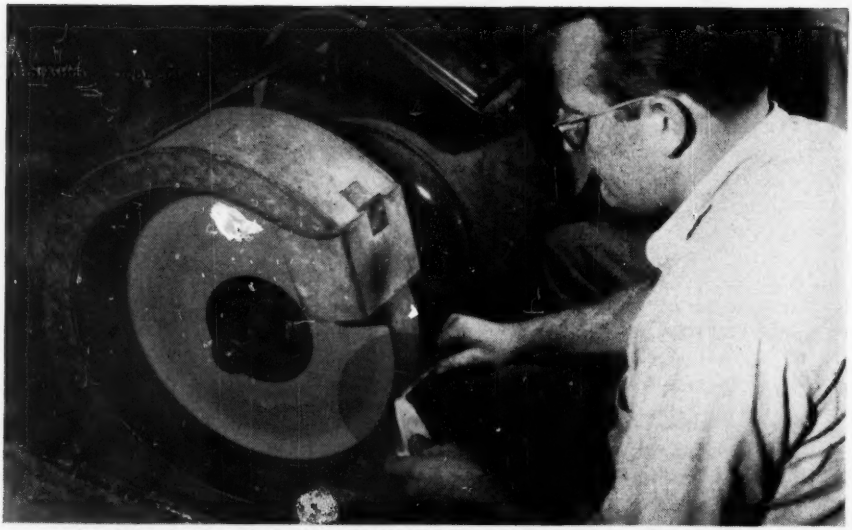

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M. L. Forney
publisher

Ezra A. Blount
editor

H. Leroy Beaver
Frank L. Bonem
Dr. C. Fred Gurnham
Bryant W. Pocock
Dr. Seymour Senderoff
consulting and contributing editors

Gene J. Schwarber
advertising manager

Norman S. Rogers
art director

K. M. Gettelman
circulation manager

VERTISING REPRESENTATIVES

Richard S. Kline
George E. Hay
431 Main Street, Cincinnati 2, Ohio
MAin 0182

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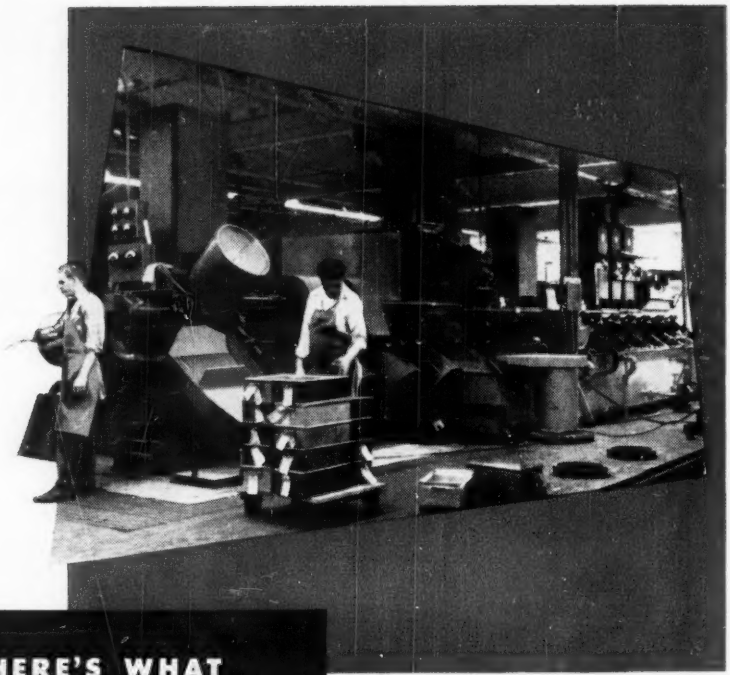

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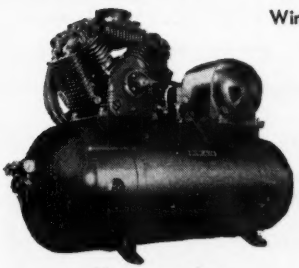

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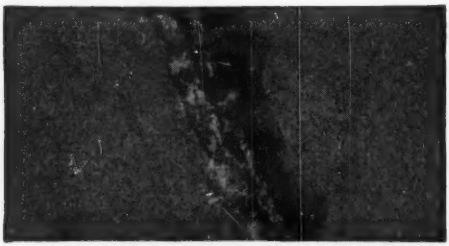
An Established Iron Phosphate Coating and Cleaning Product

Ordinary Solvent cleaning, (magnified 5 times) completely failed at 72 hours under salt spray fog. A.S.T.M. Spec. B-117-T-44.



Prep-n-Cote panel, (magnified 5 times) after 704 hours exposure to salt spray fog. A.S.T.M. Spec. B-117-T-44.

Prep-n-Cote can be used in Mild Steel Industrial Spray Washer Equipment

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- In Dip Tanks
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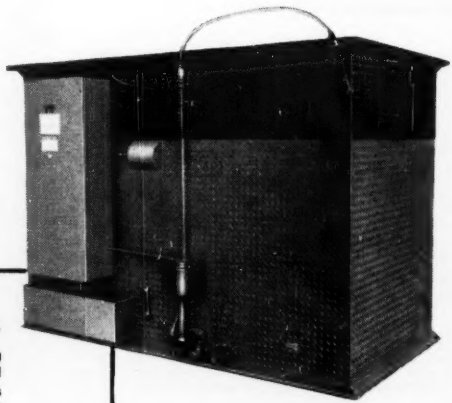

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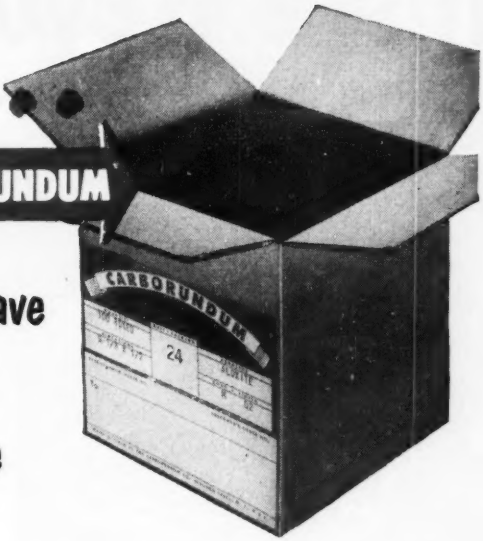

Packaged to save you time and money *on the job* and in the *storeroom!*

Fast-cutting, long-life CARBORUNDUM Brand Sander Discs now bring you extra savings —give you *more for your dollar!* Here are the reasons:

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No straps to damage disc edges—or to weaken the fibre by pressure-forcing grain into backing.

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...continually putting more cents in your abrasive dollar!

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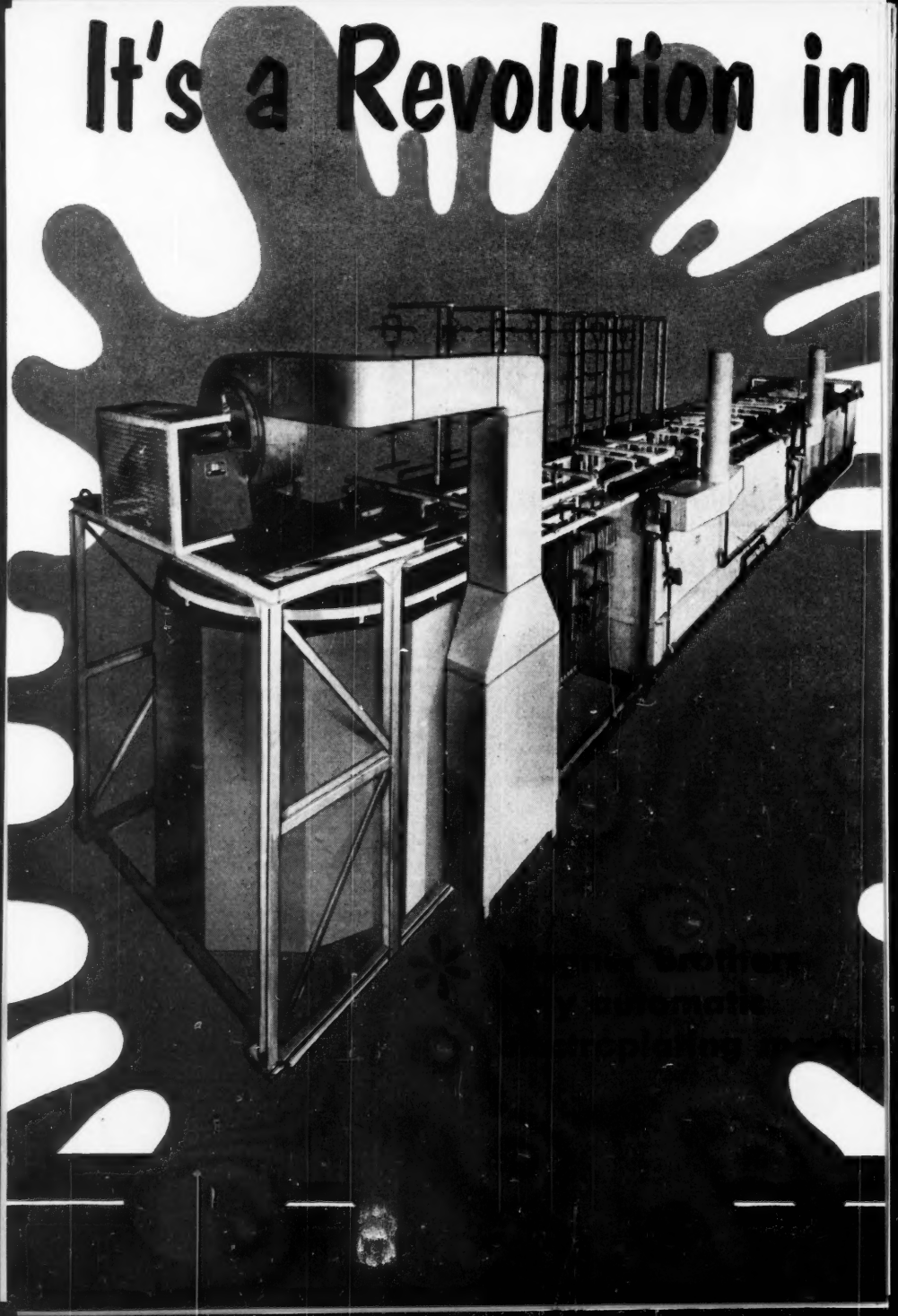
It's a Revolution in



Plating Automation

complete new approach to automation in plating—

Fully Engineered-
Proven Principles-
Now in Plating Production

CUTS LABOR — You load it and press the button — your Wagner does the rest.

CUTS DOWNTIME — All working parts are readily accessible for servicing — Built in sections for quick inspection and service without disturbing work or other sections.

CUTS POWER NEEDS—A Wagner Fully Automatic operates on *one* motor of less than half the power needed for any other electroplating equipment of comparable capacity.

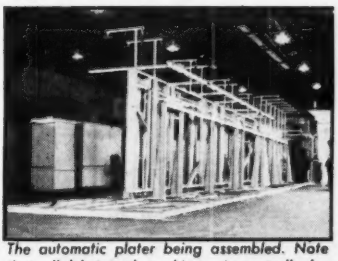
CUTS CONTAMINATION—No grease-loaded mechanisms are located above your tanks, eliminating a major plating problem.

CUTS SPACE NEEDS — Your Wagner Fully Automatic takes less floor space — less ceiling height. For example, it will handle a 48″ rack under a *12-foot ceiling.*

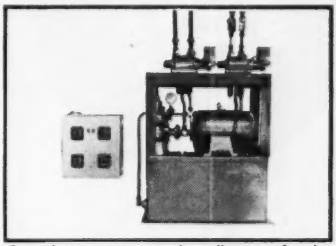
AND DOZENS OF OTHER cost cutting features. It's all new — It's fully proven — It's in production. It's Wagner Brothers Brand New Fully Automatic Plater.

Wire your nearest Wagner representative or call direct at once and get complete information on this revolutionary and efficient New Approach to electroplating automation.

Central lubrication unit (1) at loading station, greases all moving parts while operating. Reciprocating carriage (2) is actuated by simple trouble-free cylinder (3). Decelerating cams (4) operate control valve (5) to assure smooth, long life operation.



The automatic plater being assembled. Note that all lubricated machinery is centrally located—not over tanks—for easy servicing and to preclude contamination of fluid in tanks. This unit is in three sections for economical transportation.



One electric motor supplies all power for the hydraulically driven automatic plater. The power unit and control panel can be installed at any convenient point in the plant for convenience in installation, servicing and operation.

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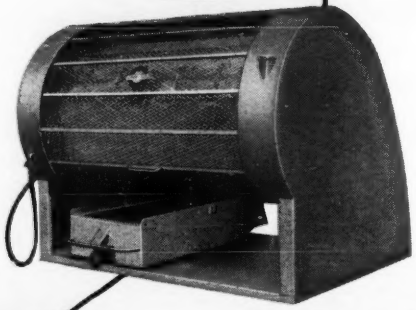
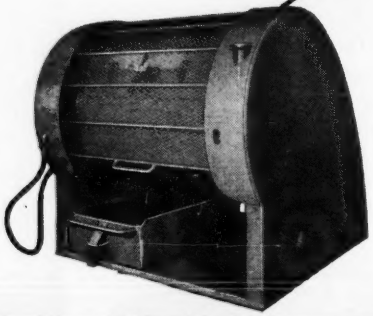


Model 66", two compartments



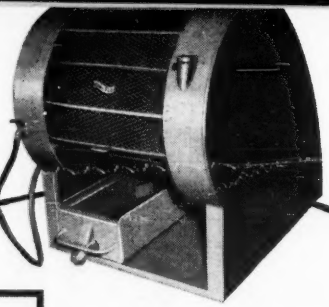
Model 48", two compartments

You can get complete equipment and supplies for faster, better tumbling at Grav-i-Flo. This authoritative tumbling source can furnish you, from its years of experience, the correct answer to any tumbling problem.

Larger capacity machines take 31% to 80% more work-load in same floor space. Improved cutting materials shorten cutting cycle by 15% to 25%. Grav-i-Flo installations substantially reduce capital investment, floor space, and production time!

MACHINES

Grav-i-Flo 66", 48" and 36" machines have cam locked doors with manually released safety stops; available with unlined or rubber lined cylinders, constant or variable speed drive, J.I.C. controls, and timers from 5 minute to 20 hour cycles. Equipped with electric wiring and water piping installed ready for plant



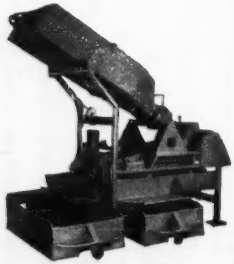
Model 36",
two compartments

Model 24",
two compartments

Designed For Small Lot Production and Laboratory Processing.

ACCESSORIES

Two deck parts-and-chips separator and chip grader



Occupies less floor space. Separates parts quickly without impingements. Grades 3 sizes of chips simultaneously.

Other Grav-i-Flo accessories include tubular yoke hoist pans, chip pans, wash-out doors, screens, chip bins, unloading boots, dip tanks.

Chips and compounds

Grav-i-Flo natural and synthetic deburring and finishing chips and highly developed compounds consistently outperform every type of tumbling process offered on the market.

Investigate!

Grav-i-Flo superiority in equipment and supplies has been proved to hundreds of users in many different industries. Let us show you, too, at no obligation. Our representative will visit your plant, or send samples direct to us. Engineering Service available to all users.

SEND FOR CATALOG showing complete line of Grav-i-Flo equipment, accessories and supplies.

THE GRAV-I-FLO CORPORATION

Dept. PF-10, 400 Norwood Avenue
STURGIS, MICHIGAN

FOSTORIA

America's Finest Engineered Ovens

SAVE SPACE • TIME • COSTS

Thoroughly proved production results in over 7,000 installations are the factual evidence that rates Fostoria the "Most Efficient of All Industrial Ovens". No other oven approaches Fostoria results in the high percentage of energy *usefully* utilized. No other oven compares with Fostoria in production per square foot of floor space. No other oven can match the quality of output or the low "per piece" cost of the high efficiency Fostoria oven.

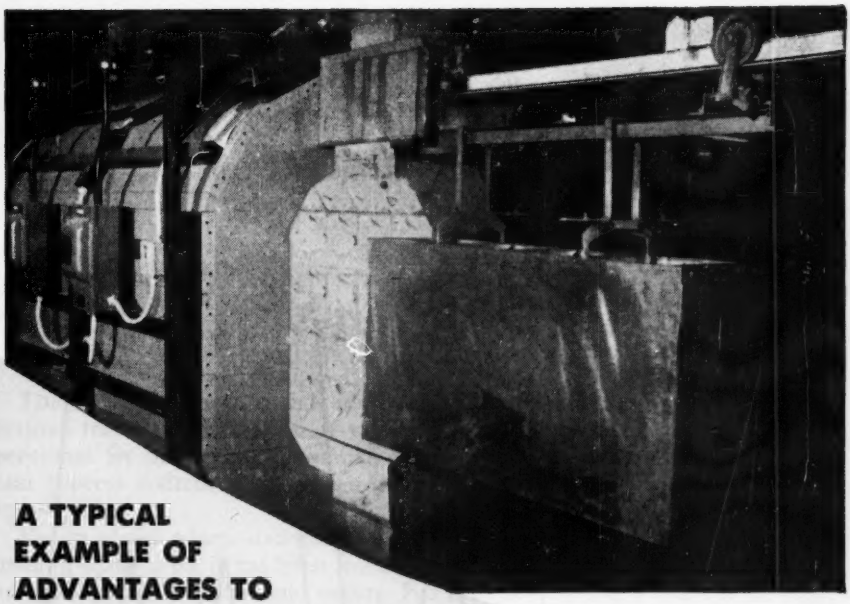
Give your plant the benefit of this modern, cost-cutting, quality improvement, space-saving equipment. Write now for complete facts.

Visit our display of Paint Heating and Infra-red Systems at the PAINT INDUSTRY SHOW, Atlantic City, BOOTH No. 85-86.

Throughout industry, new high standards of efficiency are being set by utilization of modern Fostoria oven equipment. A Fostoria representative will gladly analyze your production needs and submit recommendations for your consideration.

WRITE FOR CATALOG

WRITE for this brochure of technical facts on Infra-red and case histories of many Fostoria oven installations. Tell us about your particular problem and we will include data directly applicable to your operations.



A TYPICAL EXAMPLE OF ADVANTAGES TO THOUSANDS OF PLANTS

With a 14′ 8″ Fostoria oven, Anderson-Hickey Co., Nashville, Tenn., now bakes the finish on metal filing cabinets in 5½ minutes compared to 30 minutes previously required with another oven. Interior cabinet fittings, which were formerly baked separately, are now baked inside the cabinet. Improved quality of finish with uniform hardness and glass is now obtained.

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INFRA-RED fostoria OVENS

Send for Complete Facts

THE FOSTORIA PRESSED STEEL CORP.
FOSTORIA, OHIO, Dept. C

Please send information on Infra-red ovens for

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Name_____

Company_____

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Cowles

WM

—a low foaming, high powered washing machine cleaner

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gladly rendered on request

Charge your washing machine with Cowles WM for quicker and better removal of drawing compounds and other soils. WM cleans all types of work from shells to laundry machine tubs. WM, a highly alkaline cleaner, gives you good detergency along with a minimum of foaming for faster, more efficient longer life cleaning solutions.

We will be glad to send you complete technical information.

COWLES CHEMICAL COMPANY
METAL CLEANER DEPARTMENT
7016 Euclid Avenue • Cleveland 3, Ohio

Pf editorial

OCTOBER, 1953

Vol. 18, No. 1

People Are Important!

The Finishing Industry has become increasingly aware of the benefits to be obtained from the application of statistical quality control procedures to finishing operations. By this means the human element has been eliminated, to some degree, from process control and inspection operations, and product quality has been improved.

Yet in plants where statistical quality control has been applied successfully to finishing operations, it has been found that such an impersonal subject as statistics had aspects of a very personal nature. For example, to apply this system of manufacturing control, it was found that full cooperation of all the people at all concerned with the process must first be obtained. Hence, a program of education and instruction, to show all individuals concerned the benefits to be obtained from statistical quality control, was necessary before the system began to operate. Further, one of the unexpected and most welcome benefits from the use of quality control procedures was the increased interest shown by the employees in the process, department, and company in question.

And so it was proved again that to install a new process properly it is first necessary to explain it fully, and then to show how it will benefit everyone. Fundamentally, this is a matter of showing interest and concern for the best interests of the people in the organization. Similarly, successful personnel management centers around a consideration of the welfare of all members of the group. After all, their interests are essentially identical; namely, that the organization shall survive, prosper, and make progress.

The use of mechanical processing equipment of all kinds can accomplish a great deal in the way of increased production and lowered unit cost. Another effective means of improving an operation, and building a more cooperative, efficient unit, is to show sincere concern for the welfare of the members of the department or shop. Successful banks have used the slogan, "We not only PAY interest, we SHOW interest." Department supervisors and shop operators may find that when the same idea is applied to their daily work, the response from their associates will be prompt and substantial.

Ezra A. Blount

—EDITOR

31st Annual Meeting

Federation of Paint and Varnish Production Clubs

CHALFONTE-HADDON HALL—ATLANTIC CITY, N. J.

OCTOBER 27-31, 1953

TUESDAY, OCTOBER 27

Noon	Paint Industries' Show Opens
6:00 P.M.	Paint Industries' Show Closes

WEDNESDAY, OCTOBER 28

9:00 A.M.	Registration Opens
9:30 A.M.	Paint Industries' Show Opens
Noon	Council Luncheon
1:30 P.M.	Federation Council Meeting
5:00 P.M.	Registration Closes
6:00 P.M.	Paint Industries' Show Closes

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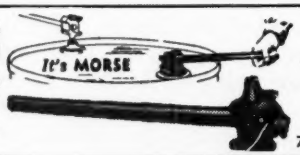
DRUM PLUG WRENCH
Instantly loosens, tightens 95% all plugs or bungs in steel drums. Has 16" extra-strong steel tubing handle. Wgt. only 2 lbs. Order 1 or more today!



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Plus Parcel Post
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762 W. Manlius St., E. Syracuse, N. Y.

THURSDAY, OCTOBER 29

MORNING SESSION—E. H. Ott, Presiding

10:15 A.M. Meeting Opens—Vernon Room
Greetings—G. H. WESCOTT, President

10:30 A.M. Welcome: H. G. SHOLL, Chairman of Meetings Committee; F. M. DAMITZ, Chairman of Host Committee; H. S. MCCONAGHIE, Chairman of Paint Industries' Show Committee

10:45 A.M. "Solvency Characteristics of Low Oder Type Thinners"—Golden Gate Club. F. K. WILSON, Chairman

11:05 A.M. "Dry Hiding Power of Paints: III"—New York Club. E. J. DUNN, JR., Chairman of Subcommittee 40

11:25 A.M. Report of President—G. H. WESCOTT

11:45 A.M. Address by JOSEPH F. BATTLEY, President of the National Paint, Varnish and Lacquer Association

2:05 P. M. "Curing Agents for Epoxy Resins"—Northwestern Club. JOHN ROUSE, Chairman
Luncheon

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THURSDAY AFTERNOON SESSION—W. J. Greco, Presiding

2:00 P.M. "An Investigation of the Spontaneous Combustion Paint Vehicles"—Louisville Club. C. M. JACKSON, Chairman

2:20 P.M. Keynote Address—"The Protective Coatings Industry: A Practical Science"—DR. ROY H. KIENLE, Director of Applied Research, Calco Chemical Division, American Cyanamid Company

2:55 P.M. Education Session—M. A. GLASER, Chairman of Federation Educational Committee
High School Student Program—DR. J. W. TOMECKO

3:15 P.M. "Emulsion Paints"—New York Club. F. B. STIEG, Chairman

3:40 P.M. "A Comparison of Alkyd Flat Latex and Other Interior Wall Paints"—Baltimore Club. JOHN EMMERLING, Chairman

4:00 P.M. Round Table Discussion—"Water Dispersed Paint Systems"—H. F. PAYNE, Moderator, H. E. Hillman, W. H. Hoback, E. C. Sholl, N. J. Timmons

6:00 P.M. Paint Industries' Show Closes

8:00 P.M. Annual Contract Bridge Tournament
Past Presidents Dinner

Doesn't YOUR product deserve a MOCO surface?

MOCO BUFFING COMPOUNDS
The "Long Mileage" line for all finishing requirements

MOCO TUMBLING BARREL COMPOUNDS
To keep pace with modern barrel finishing techniques

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Records show that improperly maintained booths run up thousands of dollars in unnecessary costs, caused by production shut-downs, extra time for maintenance, spoiled production, unrecoverable paint, and preventable booth repairs.

CUT COSTS with DuBOIS SPRAY BOOTH MAINTENANCE

Here's what you get when you do business with DuBOIS:

Thorough analysis of your operations by trained and experienced personnel. Installation of prescribed specialized compounds:

- **KLARIFIANTS** . . . Water-wash compounds to effectively control overspray
- **FILMITES** . . . coatings for dry areas of spray booths
- **STRYPP** . . . for periodic purging of old paint deposits in the hydraulic system.

FREE . . . spray booth maintenance check chart

. . . yours for the asking, a daily, weekly and monthly program for proper cleaning and maintenance of paint spray booths.

The **DuBOIS** *Co., Inc.*

Cincinnati 3, Ohio Los Angeles 33, Calif.

Serving Industry Since 1920

FRIDAY, OCTOBER 30

MORNING SESSION—F. E. Petke, Presiding

10:00 A.M. "Glossmeter Design and Gloss Standards"—Detroit Club. ARTHUR D. NEWELL, Chairman

10:20 A.M. "Evaluation of Color and Reflectance Measuring Instruments"—Chicago Club. FRED HEISS, Chairman

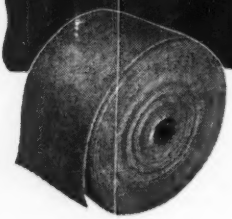
10:40 A.M. Research Committee Session
Report of Federation Research Committee—P. O. BLACKMORE, Chairman

Report of Evaluation Committee of Federation Research Projects —DR. W.O. LUNDBERG, Coordinator

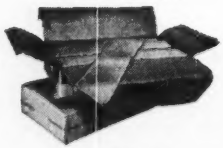
11:20 A.M. Round Table Discussion—"Gadgets and Gimmicks"—F. E. PETKE, Moderator

Luncheon

For Dust Free Finishes!
BOND TACK CLOTH



IN ROLLS
Cut off any size piece to use as needed.



IN BULK
Cut and folded. Ready to use.

STAYS SOFT AND TACKY — A SPECK-FREE FINISH EVERY TIME

Now Available in Rolls or Cut Bulk—White or Gold In Three Different Types of Cloth

Get your Tack Cloth packed just the way it's easiest for you to use . . . either in 150 yard rolls of 36" wide cloth or in handy cartons . . . 100 or more Tack Cloths to the carton.
No matter which way you buy it, you can be sure that every square inch will stay SOFT and TACKY until the very last bit is used up!
The Cut Bulk size is 18" x 36" . . . folded to 4½" x 18" for ease of handling. ALL BOND TACK CLOTH is *Spontaneous Combustion Proof, Lint-Free* and *Wax-Free*. Gives a sparkling speck-free Finish *every time*. Clean and sanitary. No waste.

TRY THEM and COMPARE RESULTS. Samples Gladly Sent Upon Request.

BOND CHEMICAL PRODUCTS CO.
"The Tacky Wiper Specialists"
2639 N. CLYBOURN AVE. CHICAGO 14, ILLINOIS

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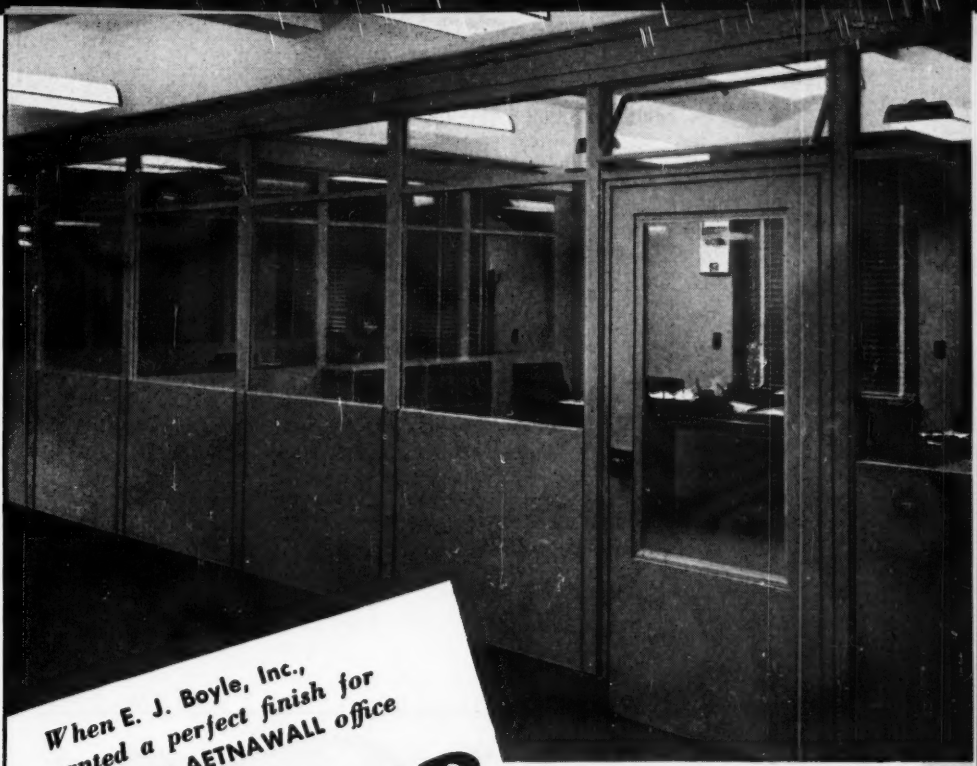
A WARRANTY OF SATISFACTION IN EVERY CARTON



When E. J. Boyle, Inc., wanted a perfect finish for its famous AETNAWALL *office partitions . . . the unchallenged choice was . . .*

Randolph
COLORED LACQUER

E. J. Boyle, Inc., a division of Aetna Steel Products Corporation, manufactures Aetnawall, considered the finest in prefabricated hollow metal walls. For this leading, long-established concern, Randolph produces a superior finish — lacquer available in a variety of distinctive colors. This finish provides a rich, attractive sheen that helps create the heavy demand for these partitions in modern offices. Its quick-drying features are essential to fast-moving production, and the handling of rush orders, large or small.

E. J. Boyle, Inc., is one among a large variety of firms that depend on Randolph for specially-formulated, highly suitable and serviceable surface coatings.

Consult Randolph to get a finish that makes *your product* look, wear — and sell — better!

RANDOLPH PRODUCTS CO.

DEPARTMENT B

CARLSTADT, N. J.

DOPES LACQUERS ENAMELS THINNERS

FRIDAY AFTERNOON SESSION—H. Kelfer, Presiding

2:00 P.M. "The Protectometer and the Evaluation of Anti-Corrosive Primers" —M. A. DANFORTH, K. H. E. LARSON and Dr. WOUTER BOSCH, of North Dakota Agricultural College

2:45 P.M. "A Study of Vehicles and Pigments in High Heat Resistant Coatings"—Houston Club. H. C. OWENS, Chairman

3:05 P.M. The Joseph J. Mattiello Lecture—"The Effect of Pigments Upon the Mechanical Properties of Protective Coating Films"—Dr. ADOLF C. ELM, of the New Jersey Zinc Company

4:20 P.M. Round Table Discussion—"Production Planning and Scheduling" —R. J. GNAEDINGER, Moderator, A. H. Benson, J. E. Creager, H. E. Einbecker, E. F. Jago, and H. E. Miles

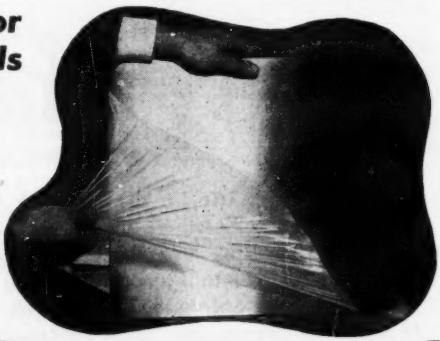
5:00 P.M. Annual Business Meeting—Business of the Federation, Report of Election and Announcements

6:00 P.M. Paint Industries' Show Closes

6:30 P.M. Annual Banquet

10:00 P.M. Dance

A Strippable Plastic for the Protection of Metals



Striplastic is a protective plastic applied by spraying, dipping or rolling. It is used on stainless steels, high polished metal sheets, sheets in cold working or drawing, tools, dies and parts, and on sheets or metal parts before packaging. It protects against scratching and abrasion, and against rust. Also available as a booth coat protection.

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Among many advantages, it is nontoxic, possesses great tensile strength and is easily stripped off in one piece. Write for complete information on this new strippable plastic.

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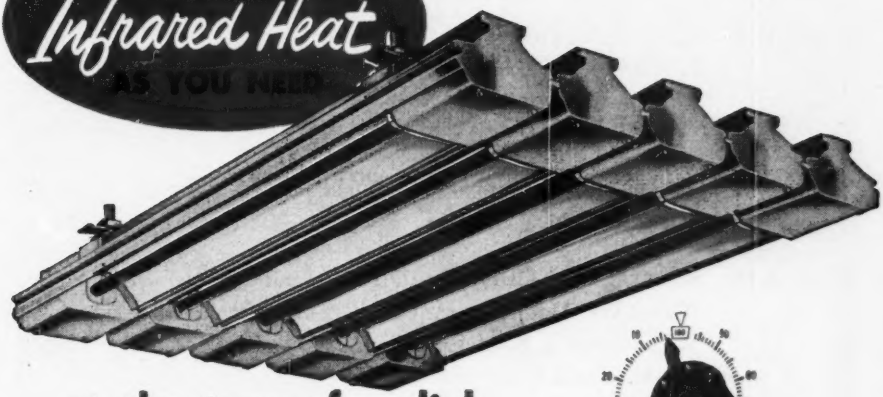
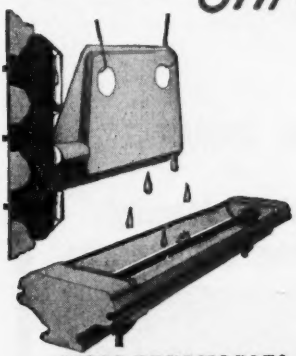
Infrared Heat

AS YOU NEED



at the turn of a dial . . .

ALL-METAL *Chromalox* RADIANT HEATERS



NON-BREAKABLE!

Shocks, vibration, steam, splashed liquids do not damage Chromalox Radiant Heaters. There's nothing to break, nothing to shatter, nothing to contaminate work.

With CHROMALOX Electric Radiant Heaters you can dial and get precise temperatures needed for baking, drying, degreasing and other finishing applications. Ovens using Radiant Heaters can be zoned for stepped-down or stepped-up temperatures to meet the needs of the job.

CHROMALOX Radiant Heaters operate in low or high ambient temperatures; give glareless radiation in far-infrared wave lengths which are efficiently absorbed by all colors, textures and surfaces; are safe where volatiles are present. Light, dark and multi-work can be processed simultaneously; proper heater positioning assures an even blanket of heat without hot spots. All-metal construction withstands shock, vibration, rough handling and is not affected by splashed liquids. Units are compact, flexible, easy-to-install in your present equipment.

For more "know-how"

Write for Application File which shows how to increase production and reduce finishing costs with Chromalox Radiant Heaters and gives complete details on these versatile, efficient units. IC-81

CHROMALOX *Electric Heat for Modern Industry*

EDWIN L. WIEGAND CO., 7552 Thomas Blvd., Pittsburgh 8, Pa.

SATURDAY, OCTOBER 31

W. W. Cranmer, Presiding

9:30 A.M. Round Table Discussion—"Putty and Caulking Compounds"—G. E. Hann, H. W. Hibbert, W. M. Lawall, and Dr. R. L. McCleary

10:40 A.M. "Conquering Fire"—C.D.I.C. Club. DR. C. J. OPP, Chairman

11:00 A.M. "Formulation of Fire Retardant Paints"—Baltimore Club. P. BOTZENMAYER, Chairman

11:20 A.M. Round Table Discussion—"Fire Retardant Paints"—Dr. M. W. WESTGATE, Moderator, A. O. Allen, G. S. Cook, R. W. Craig, W. W. Cranmer, I. R. Messers, B. J. Taylor, A. W. Van Heuckeroth, Dr. M. Van Loo

Announcements

1:30 P.M. Meeting Closes

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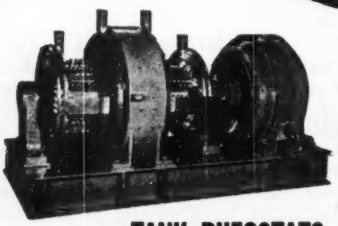

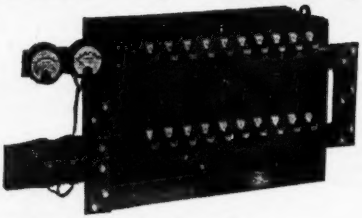

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Roto-Finish maintains a completely equipped laboratory which processes parts to your specifications with guaranteed results. Send a few unfinished parts . . . with a finished part as a guide, for prompt recommendation of the Roto-Finish process that exactly fits your requirements.

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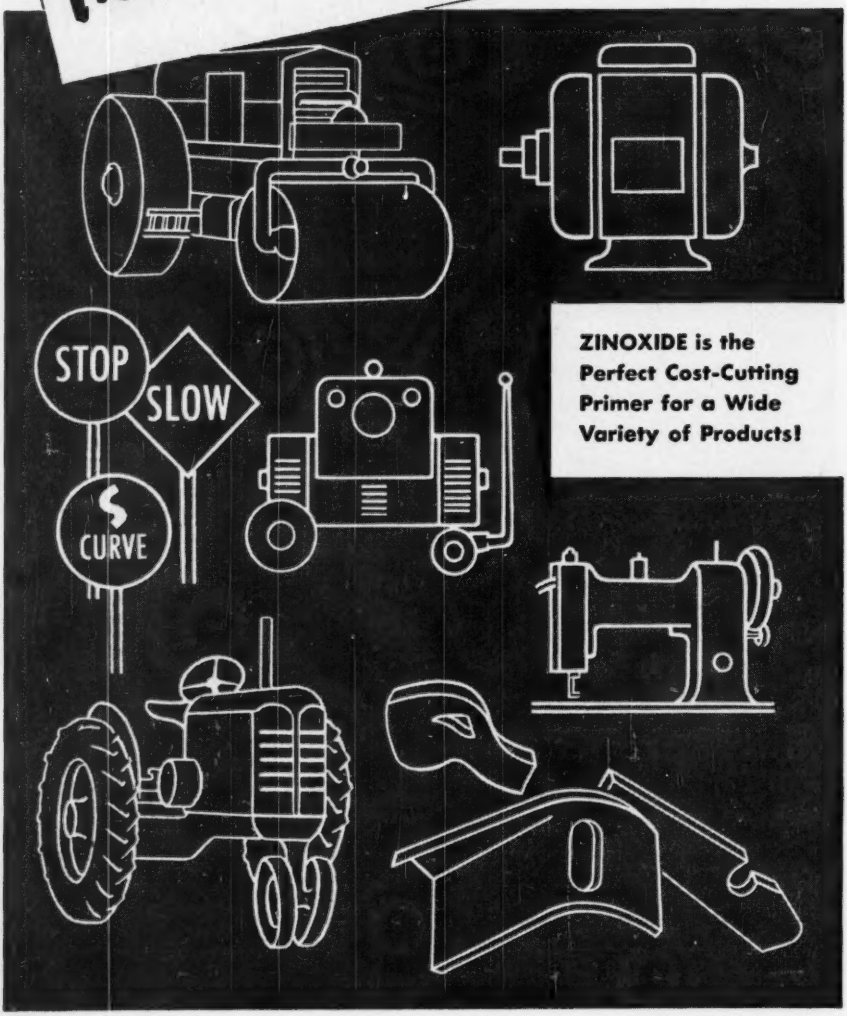

ZINOXIDE is the Perfect Cost-Cutting Primer for a Wide Variety of Products!

And Only Known Zinc & Oxide Primer made in 3 colors!

Lowe Brothers ZINOXIDE Primer makes Finishing News as the Outstanding METAL PRIMER DEVELOPMENT of Today!

now available in...

Lowe Brothers' case history files are already packed with factual evidence that ZINOXIDE Primer is one of the greatest developments in the history of industrial finishes. *But now,* by making it available in *3 colors,* Lowe Brothers "Finishing Specialists" have given users of ZINOXIDE a tremendous extra advantage. *Now,* you can select a prime coat *in the color closest to that of your finish coat* and enjoy all of the additional savings in handling time and material costs made possible by just one final finishing coat!

Check These Outstanding ZINOXIDE Features!

ZINOXIDE contains the finest corrosion resisting pigments known—zinc chromate and oxide! No overspray . . . Perfect adhesion, even to aluminum . . . Dries in minutes . . . Practically eliminates need for sanding . . . No "orange peel" in finish coat!

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THE LOWE BROTHERS COMPANY • Dayton 2, Ohio
Industrial Division

This advertisement is based on facts from Lowe Brothers industrial case history files.

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FINISHES FOR INDUSTRY

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CHALFONTE-HADDON HALL, OCTOBER 27-31, 1953

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Advance Solvents & Chemical Corp.
C. M. Ambrose Co.
American Cyanamid Co.
Anderson-Prichard Oil Corp.
Archer-Daniels-Midland Co.
Atlas Electric Devices Co.
Atlas Powder Co.
Bakelite Co.
Baker Castor Oil Co.
Bede Products, Inc.
Bennett Industries, Inc.
Binney & Smith Co.
Bowser, Inc.
Burt Machine Co.
Godfrey L. Cabot, Inc.
Carbide & Carbon Chemicals Co.
Carbola Chemical Co., Inc.
Carbon Dispersions, Inc.
Cargill, Inc.
Celanese Corp. of America
Chisholm-Ryder Co.
Cuno Engineering Corp.
J. H. Day Co.
Dow Chemical Co.
Eastman Chemical Products, Inc.
Edgar Brothers Co.
Epworth Manufacturing Co., Inc.
Fostoria Pressed Steel Corp.
Gardner Laboratory, Inc.
General Electric Co.
Goodyear Tire & Rubber Co., Inc.
Gray Co., Inc.
Harshaw Chemical Co.
Hercules Filter Corp.
Hercules Powder Co.
Herman Hockmeyer & Co.
Spencer Kellogg & Sons, Inc.
Kent Machine Works, Inc.
Kenetic Dispersion Corp.
Lead Industries Association
J. M. Lehmann Co., Inc.
Metals Disintegrating Co., Inc.
Mineral Pigments Corp.
Monsanto Chemical Co.
Morehouse Industries
Naftone, Inc.
Neville Co.
Nopco Chemical Co.
Nuodex Products Co., Inc.
Pacific Vegetable Oil Corp.
Paint Industry Magazine
Patterson Foundry & Machine Co.
Pennsylvania Falk Chemical Co.
Plaskon Div., L.O.F. Glass Co.
R-B-H Dispersions
Reichhold Chemicals, Inc.
Rheem Manufacturing Co.
Rohm & Haas Co.
Chas. Ross & Son Co.
Ross & Rowe, Inc.
Shell Chemical Corp.
Shell Oil Co.
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Self-Operating
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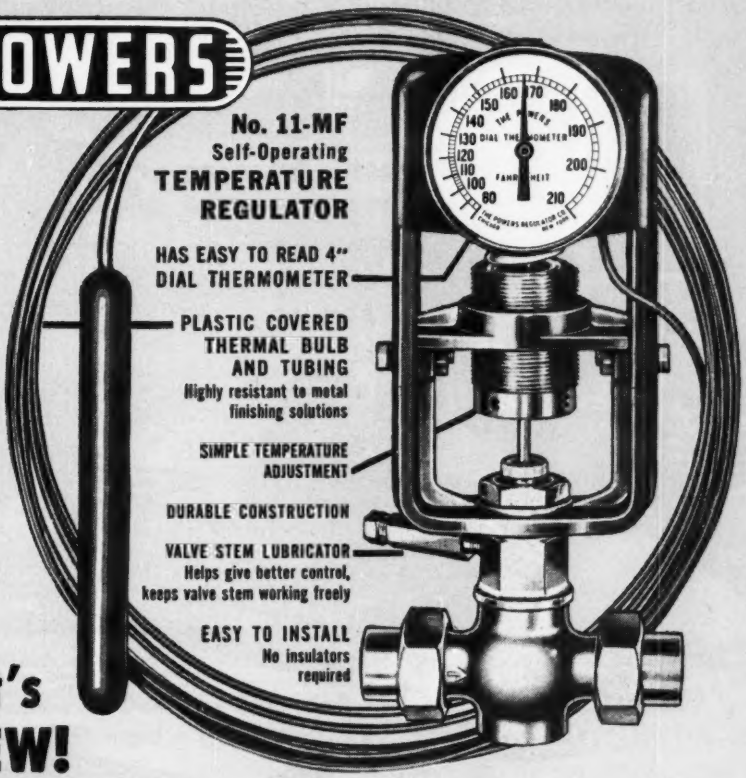
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PLASTIC COVERED THERMAL BULB AND TUBING
Highly resistant to metal finishing solutions
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VALVE STEM LUBRICATOR
Helps give better control, keeps valve stem working freely
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No insulators required

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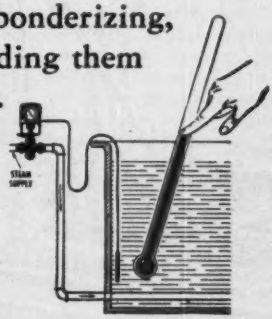
Saves LABOR—Will help you get the most effective use from solutions in plating, anodizing, bonderizing, pickling, cleaning and rinsing by holding them at the right temperature automatically.



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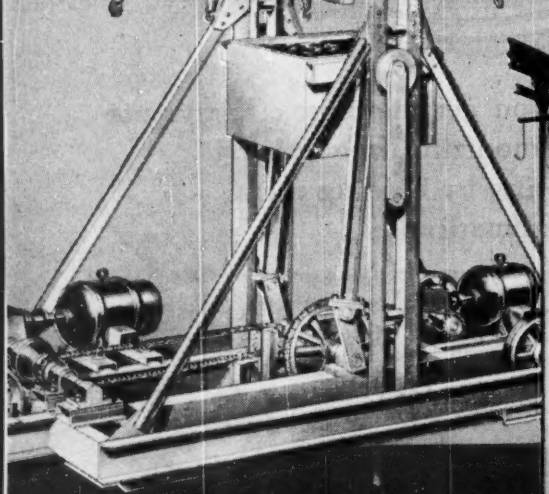
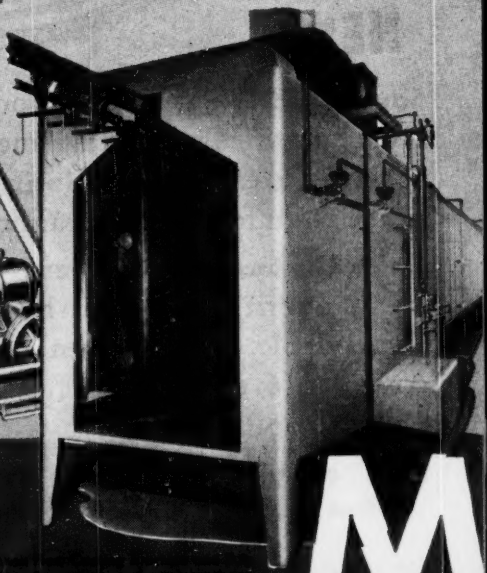
At Right: Mahon Conventional Type Hydro-Filter Spray Booth. Above: Interior view of Typical Mahon Dip-Coating Equipment. Finish Baking Oven is located above.





M

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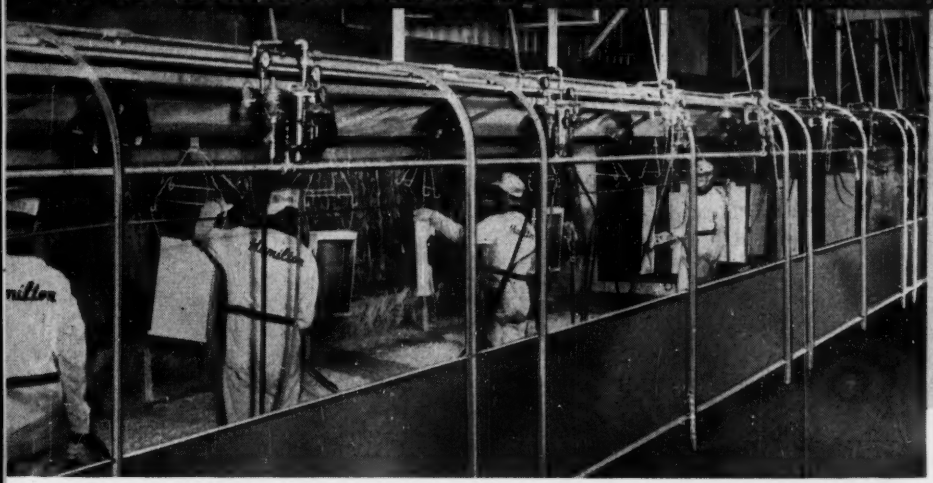

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In some plants, where our advice on finishing methods has been sought, we have found parts being flow coated when substantial savings could have been effected in the over-all finishing costs through the employment of the dip method—savings in thinner, paint, initial cost of equipment and maintenance . . . and the dip method, in this particular operation would have provided a better finish with fewer rejections. It is therefore wise to get expert advice when confronted with a finishing problem, regardless of what the part or product may be. Many factors enter into the basic and all-important decision on method or combination of methods to be employed to produce the finest results at the lowest possible unit cost. Mahon engineers, with a background history covering thousands of complete finishing systems—including Dip, Flow Coating and Spray Equipment—are in a position to make sound, unbiased recommendations on the "HOW" to finish any product under any conditions or production requirements. Over thirty years of experience in planning, designing, building and installing finishing systems of every type for every conceivable product painted on a production basis, has equipped Mahon engineers with a wealth of technical knowledge and practical know-how not available elsewhere . . . can you afford to rely on less? See Mahon's Insert in Sweet's Plant Engineering File, or write for Catalog A-654.

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AHON

Exacting requirements of equipment for our nation's hospitals makes necessary a wide variety of durable corrosion-resistant sanitary finishes which at the same time must create a pleasing appearance for these important products. Polished, electroplated, and paint finishes are applied in the plant of Ohio Chemical & Surgical Equipment Company, a division of Air Reduction Company, Inc., Madison, Wisconsin.

By EZRA A. BLOUNT
Editor

A leader in the surgical equipment field, Ohio Chemical & Surgical Equipment Company manufactures some 2,000 products composed of over 20,000 parts. Chief among the lines of equipment marketed by the company are the following: Ohio medical gases and therapy oxygen, anesthetic, therapeutic and resuscitative apparatus, oxygen pipeline equipment, sterilizers, operating tables, lights, cabinets, Sterilbrite furniture, sutures, Stille instruments.

Not limiting its efforts to the

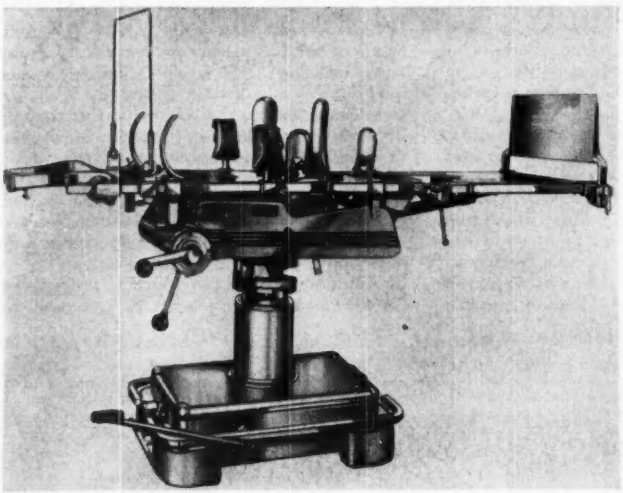
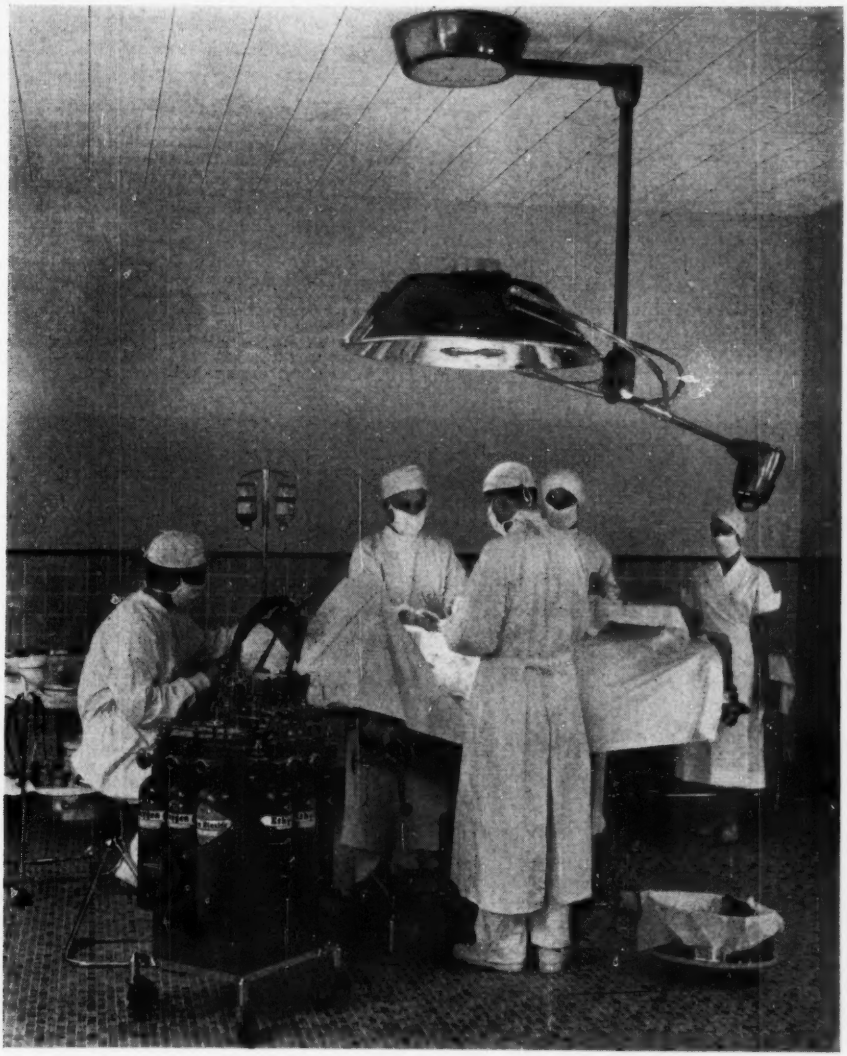
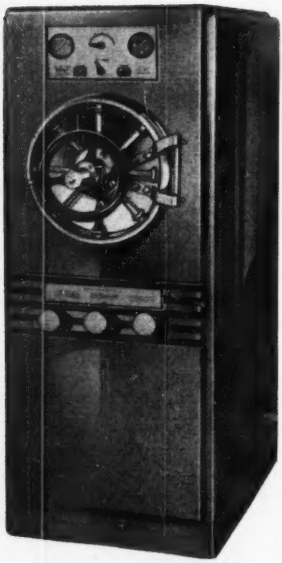


Fig. [illegible] Ohio-Scanlan A-7100 Selectrol Major Operating Table. The table top sections are cast aluminum alloys covered with polished stainless steel. The base casting is covered with polished stainless steel and the pedestal is finished in hard chromium plate.

Fig. 2—A typical scene in one phase of medical activities shows several products of the Ohio Chemical & Surgical Equipment Company in use. Most recent development of the company is the Surg-o-beam adjustable surgical illuminator. It provides from 1000 to 3000 foot candles of cool, color-corrected light; it is designed to reduce shadows and is extremely maneuverable. Iron elements of the Surg-o-beam are finished in green melamine polychrome baking enamel. The reflector is spun aluminum, finished by the Alzak process. Other parts are finished in bright chromium plate.

Also shown is an Ohio Kinet-O-Meter Model No. 550 used for anesthesia. Top of the cabinet is polished stainless steel. Valves and fittings and trim are brass, nickel and chromium plated. The cabinet body is steel, finished in silver green baking enamel.



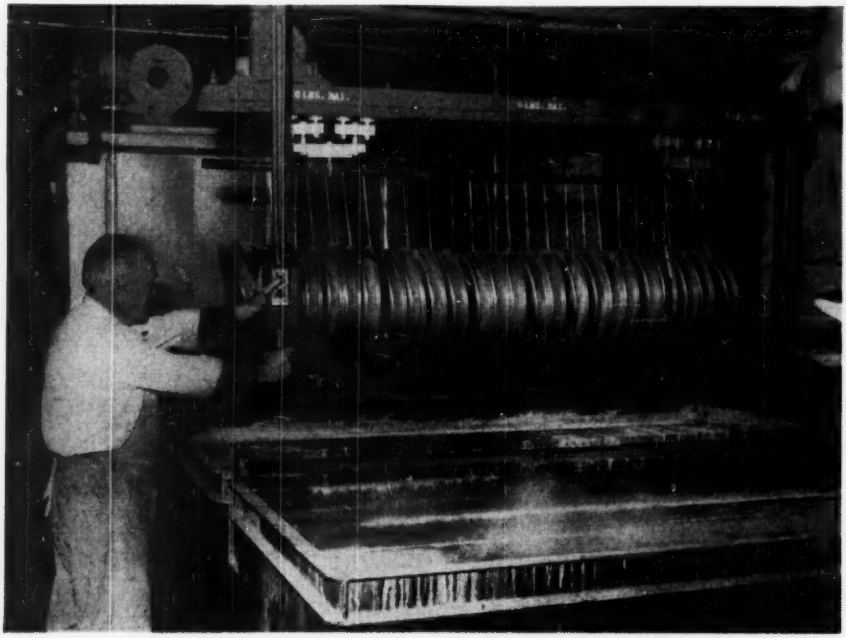


design and manufacture of surgical equipment, the company conducts a Hospital Planning Service to aid architects and hospital administrators in the planning and proper installation of equipment so that the most satisfactory results will be obtained.

●

Fig. 3—(Left) Ohio Model A425 completely automatic instrument washer-sterilizer automatically scrubs, sterilizes, drains and dries instruments in about 17 minutes. Sterilizer outer shell or body is finished in Egyptian MNL-23 baking enamel. Control panel is stainless steel with a brushed finish. Washing and sterilizing chamber is polished Monel. The heavy door and locking assemblies are bronze, nickel plated.

Fig. 4—(Below) A load of cast iron ceiling hanger tracks for Surg-o-beam surgical light ready for cleaning and phosphatizing prior to paint finishing. Specially designed conveyor has controls at working level mounted on rod used to push load from tank to tank, giving operator easy control over load at all times.



In addition, the company has for twenty years published the magazine, "Surgical Equipment," distributed to medical authorities and hospital technicians, reporting significant developments in hospital equipment and technique. This most constructive program, which has as its objective the marketing of surgical equipment designed to keep pace with developments in medical knowledge and practice, has been responsible for the growth of Ohio Chemical and its establishment as a leader in this important field.

Surgical equipment design engineers must employ a wide variety of metals and alloys to fulfill the requirements imposed by conditions of use of these products. As can be imagined, methods of finishing the many metals and alloys are varied, the only constant being the high quality level that must be maintained regardless of the type of finish employed. Finishes on this equipment must present an attractive appearance, must be easy to keep clean, must withstand high temperatures and corrosion from steam or other vapors (sterilizers, and so on), and must withstand a great deal of service abuse without visible damage to the finish. Hospitals are too busy to have equipment out of service for refinishing, or even replacement.

Fig. 5—In the Binks three-section water wash spray booth, parts may be sprayed while on pallets, on shop trucks, or suspended from the overhead conveyor. Note how conveyor track is provided with switches so that loads can be moved into any one of the three sections.

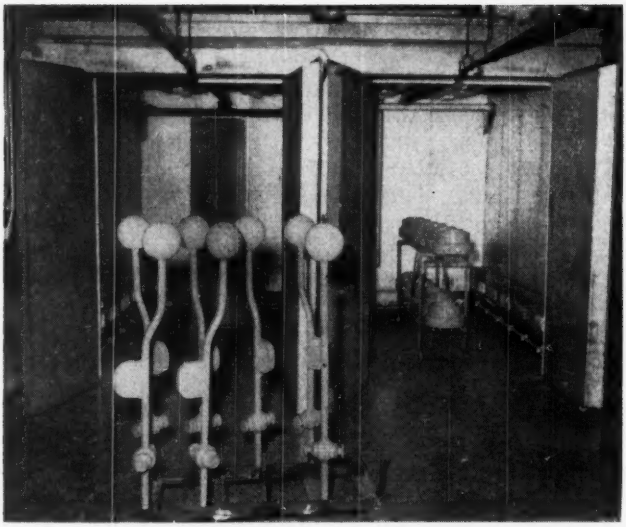


Fig. 6—Two of the Burdett infra-red gas fired ovens installed in the Ohio Chemical & Surgical Equipment Company plant. Parts may be rolled into the ovens on shop dollies for baking after spray painting, or may be moved in on conveyor tracks.

jigs, fixtures, paint masks, plating racks, polishing frames, and so on, so that the many parts may be processed economically. The finishing equipment installed in this plant demonstrates the fact that finishing departments do not need to be extremely large to be efficient, and that finishing equipment manufacturers can supply equipment designed for sound operation, even on a semi-job shop basis.

Finishing Processes

The 20,000 odd parts, made from a variety of metals and finished in an equally wide variety of finishes creates a manufacturing situation more akin to job shop operation than production line process flow. However, the process engineers and manufacturing supervisors of Ohio Chemical have been equal to the task of planning efficient production under such conditions. They have installed a manufacturing and finishing setup that is both efficient and versatile; in which smooth material flow is accomplished by efficient production control, routing, and classification of parts by material and finish. In addition to the more extensive and intensive planning required for efficient operation under such conditions, there is the additional requirement for the design and manufacture of a large number of

Paint Finishing Setup

Steel, iron, brass, and aluminum cast or sheet products are processed through the paint finishing section where they are coated with a variety of lacquer or enamel coatings as specified by designers and finishing engineers. Preliminary surface treatment of iron castings includes grinding with 36 grain emery wheels followed by polishing with 120 emery polishing wheels, or abrasive belts operated on backstand polishing lathes. Brass and aluminum castings are polished with 220 emery on abrasive belts or set-up wheels, and then wire brushed to achieve the desired

surface finish. Steel or aluminum formed sheet metal parts are spot polished as required to remove any marks left by the fabrication departments.

Metal parts to be finished in enamel or lacquer, after polishing, are processed through a five-tank cleaning and phosphatizing setup (see Fig. 4). The tanks are each 8½ by 3½ by 4 feet and hold approximately 800 gallons of solution. As can be noted in Fig. 4, a tramrail crane and electrically operated hoist, designed by Ohio Chemical engineers, are employed to move loads of parts from tank to tank. The hoist is attached to a section of Richards-Wilcox Zig-Zag Safe-Rail conveyor track, so that the loads of parts may be pushed from the hoist onto other conveyor track after phosphatizing for transport through the rest of the finishing system. A 3 h.p. motor and fan and 34-inch stack serves as an adequate exhaust system. Steam is removed from the surface of the tanks, the vapors being drawn across the tops of the tanks into the exhaust ductwork which is located on the tank away from and opposite the crane operator.

Racked on hooks attached to conveyor hangers, metal parts are cleaned and phosphatized in the following process.

1. Clean for 5 minutes in Alkali Cleaner No. 5A; concentration 6 to 8 oz./gal.; temperature 190 to 200 deg. F. Tank is steel and solution is heated with Burdett U-type retort tube gas fired immersion heaters.
2. Rinse in flowing water held at 130 deg. F. by immersion gas heater.
3. Phosphatize for 3 to 10 min. (depending upon type of metal being treated) in Industrial Chemical Sol-Klean solution (1 part Sol-Klean to 3 parts water) at 130 to 150 deg. F.

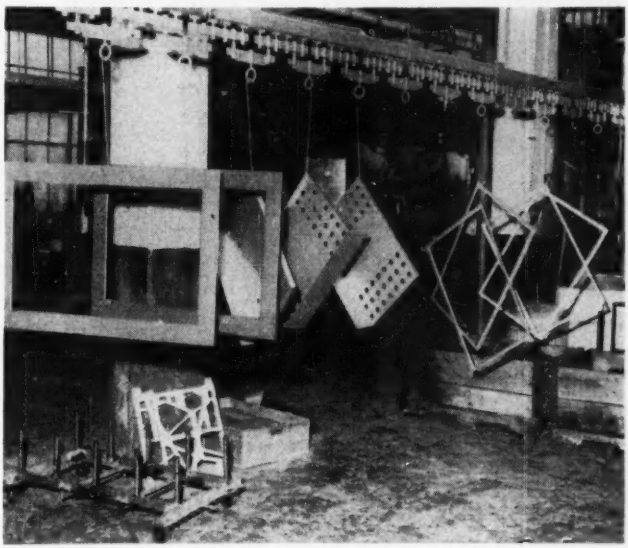


Fig. 7—Spray finished parts after final baking and inspection are shown still suspended from hangers on the Richards-Wilcox Zig-Zag Safe-Rail track while awaiting transportation to the assembly areas. Load carriers are then rolled just a few feet to the loading station for the phosphatizing operation, and unfinished parts are then loaded to start the cycle all over again.

Tank and immersion burner tube for tank heater are made of stainless steel.

4. Rinse in cold water (flowing) in steel tank.
5. Neutralize 1 minute in Duo-Rinse solution (1/30 of 1 per cent by volume) at 180-190 deg. F.

Two racks of neutralized parts may be placed in an 8 by 6 by 8-foot Burdett infra-red gas-fired oven for drying after phosphatizing and neutralizing. Some parts are dried at 350 deg. F. for 5 minutes; others are dried at 575 deg. F. for ½ hour. The drying oven may be seen in the background of Fig. 4. It is a 347,000 Btu oven and can be heated to temperature from a cold start in 1½ hours.

The process employed to apply paint finishes to phosphatized and dried castings varies with the type of final finish. Generally, castings must be filled, sealed, primed, and finish coated, with sanding operations between coats, and baking operations where required. The shop area adjacent to the drying oven previously mentioned is employed for the filling and sanding operations, so that the same oven may be used for baking filler coats as is used for drying the phosphatized parts. In a "batch" type of operation, it is highly efficient to use one piece of equipment for several operations. This would be impossible in a fully conveyorized plant. Not all filled castings must be baked. For those castings to be finished in air dry lacquer, an air dry filler is applied, followed by a sealer or primer similarly formulated. For such filling operations Lowe Bros. Thermo Sprafil or Lowe Bros. Pyroxalin Base filler may be applied. Parts to be finished in a high bake enamel finish are filled with O'Neil Duro filler and baked at 300-350° F.

After the filler coat is dry or has been baked, parts are sanded with 220 emery paper using a National Air Sander. For application of the sealer or primer coats, parts move, either on conveyor trolleys or on rolling work tables, to the Binks three-sec-

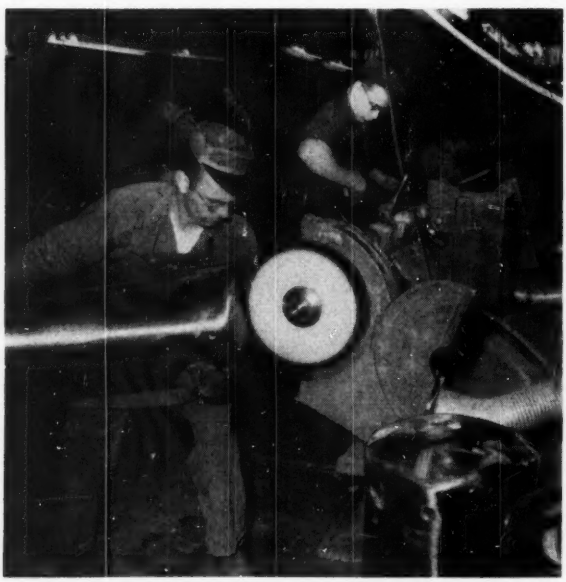


Fig. 8—A view of the polishing and buffing department, showing two Monel water sterilizers being polished and buffed to a bright finish.

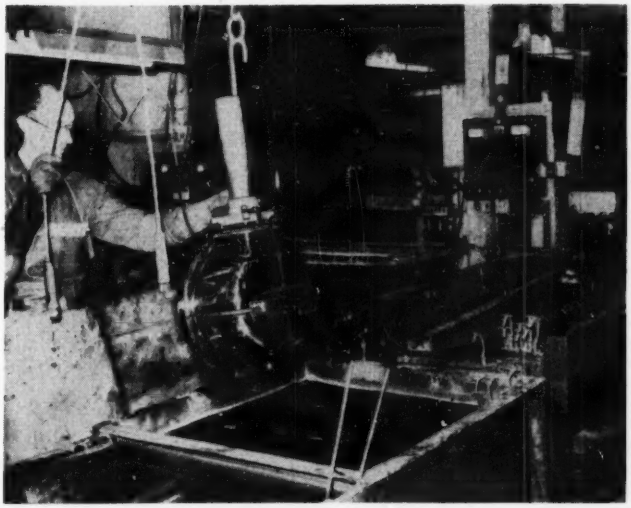


Fig. 9 — Final plating operation on many brass parts is a chromium plate. Heavy parts must be transferred from plating tank to double rinse tank setup by overhead chain block and roller conveyor. Special racks and special anodes are a requirement for the many varied products manufactured by the company, as the photo illustrates.

tion water wash spray booth shown in Fig. 5. The spray booth is 8 feet high with a 5-foot working depth, and each section is 6 feet wide. Thus, as is required by the type of operation, several finishes may be sprayed at any one time without mutual interference or confusion.

The booth has a stainless steel backing sheet for the water to flow over, and features an end separating tank fitted with a desludging weir. Water flows down the water curtain at the rate of 576 gal./min., or 24 gal./min./linear foot of spraying width. A water wash spray booth compound is used to aid operation of the system and minimize maintenance. The entire system is flushed out once per week. For the dry walls of the spray booth Liquid Envelope spray booth coating is used to catch the paint overspray. This material plus the accumulated overspray may be peeled off the spray booth walls at maintenance periods, leaving the original spray booth wall surfaces clean and ready for spray application of another protective coating of Liquid Envelope.

Sealed or primed parts that require baking may be routed to the Burdett oven installed adjacent to the phosphatizing setup and the filling area, or may be baked in one of the two ovens installed at the other end of the spray finishing department. These ovens, a view of which is shown in Fig. 6, are connected with the spray booth by the Richards-Wilcox overhead conveyor so that loads of parts may be baked while still on the conveyor, or roller dollies of parts may be moved into the oven for baking, as the photo illustrates.

The two Burdett infra-red gas fired ovens shown are each 9 feet long, 5½ feet wide, and 8 feet high. Each is fitted with Minneapolis-Honeywell temperature control and Protectoglo equipment, installed and tested before leaving the Burdett factory.

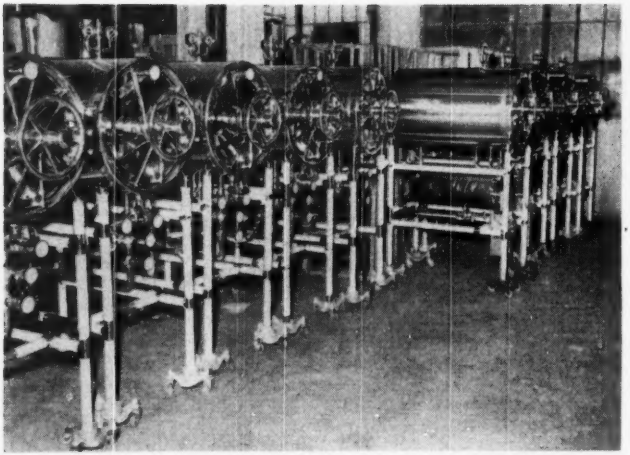


Fig. 10—A row of assembled Ohio cylindrical pressure sterilizers await final packing for shipment. Sterilizer bodies are covered with a polished stainless steel jacket. Cast bronze doors are accurately machined and nickel plated. Locking bars are stainless steel.

feet of track, 11 switches, and 1 turntable.

Polishing and Plating Facilities

Sealed parts are baked at 300 to 350 deg. after which they are sanded smooth with 220 emery.

A popular finish coat for the line of surgical equipment manufactured by Ohio Chemical & Surgical Equipment Company is Egyptian MNL-23, a green melamine polychrome or metallic baking enamel. Sheet metal parts are cleaned and phosphatized but not primed when using the MNL-23. Then the green baking enamel is applied and baked at 300 to 325 deg. F. for 18 minutes. The exact time is varied as required for different metals, sizes, thicknesses, and so forth.

After the finish coat is baked, parts move around the oval-shaped finishing setup for inspection and transfer to trucks or pallets for transportation to assembly areas. Figure 7 shows several parts on the conveyor awaiting transfer from the finishing department. This versatile conveyor system, which meets the need of this "batch-type" finishing setup so capably, is 500 feet long, with 350

To achieve the bright finishes on many parts for hospital equipment, polished stainless steel or brightly-buffed aluminum parts are used. Brass and bronze parts are nickel and chromium plated. Monel parts are polished and buffed to a high luster. Both stainless steel and aluminum are given a satin finish by wire brushing. The wide variety of parts and finishes makes necessary the employment of a great many polishing lathes and special polishing fixtures. Figure 8 shows Monel water sterilizers being buffed. Sterilizer heads are buffed without the aid of fixtures, but the long body area can be buffed on a special hanger, as shown in the background of Fig. 8.

Conventional polishing cycles are employed for polishing brass castings. The first operation employs 80 grain emery with set-up wheels or polishing belts and backstands. Next, parts are polished with 120 emery, followed by a 200 or 220 emery operation and a final tripoli buff. Polished and buffed parts

no job too complicated—
no job too unusual!

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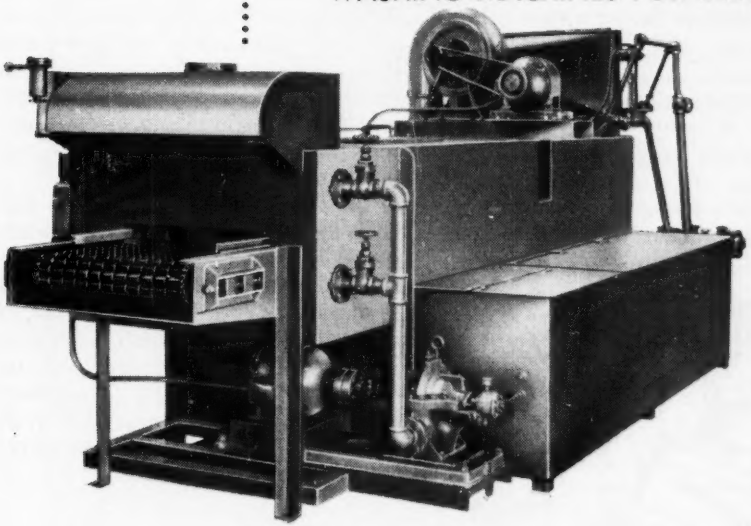

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(usually brass, bronze, copper, iron, or steel) are cleaned and plated in the following process:

1. Rack and clean in Oakite Type 27 soak cleaner.
2. Electroclean in Oakite A Plater's Special cleaner. Separate tanks are used for ferrous and non-ferrous metal parts.
3. Water rinse.
4. Sulfuric acid dip.
5. Nickel plate in dull nickel or Harshaw Bright nickel.
6. Rinse, dry, and buff as required.
7. Bright nickel parts may be taken directly to the chromium plating tank shown in Fig. 9. The steel, lead-lined tank holds 360 gallons of solution. The solution contains 53 oz./gal. of chromic acid with a sulfate ratio of 120 to 1. Plating is carried out at a temperature of 95 to 100 deg. F.
8. Rinse in double rinse setup and dry.

Steel and iron parts are also cadmium or zinc plated for corrosion resistance, where a bright finish is not specified. Hard chromium plating is employed to finish some products. Some stainless steel parts are barrel deburred instead of or prior to final polishing. Some parts are assembled with glass components, and then nickel and chromium plated. Large aluminum reflectors for surgical lights are spun from sheet aluminum, and then finished by the Alzak process.

The wide variety of surface finishes applied to a great many metals places a great responsibility on finishing engineers and supervisors in this plant. The final products of their skill, a few of which are shown in Figs. 1, 2, 3, and 10, show that no effort has been spared to produce an attractive, high quality finish in keeping with the operational effectiveness of the product.

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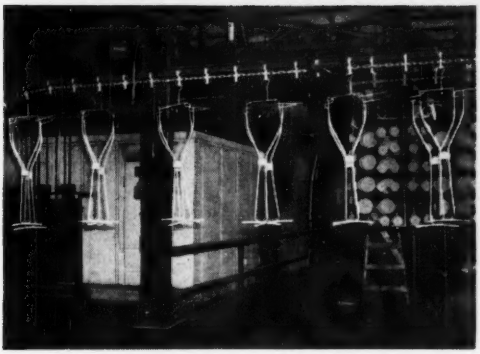
with BURDETT *Radiant Heat* OVEN



Above—Exterior of Burdett "Radiant Heat" Oven showing panel board and finished lawn mower parts.

Below — Interior of Burdett Oven showing Burdett "Radiant Heat" Burners and recirculating system.

20,000 lbs. workload per 8 hour day with new, compact, 4-pass Oven

Actually, this represents approximately 1¼ complete lawn mowers per minute, and is merely further confirmation of the unusual results enjoyed by leading manufacturers in all manner of drying, dry-off, and baking processes, as well as burn-off, cooking, soft metal melting, etc. Savings of from 30% to as much as 70% are consistently recorded from all industries. The secret of these revolutionary results is the deep heat penetration, complete combustion of all gases for maximum fuel economy, constant uniformity of product, and flexibility of application as proved on every Burdett "Radiant Heat" Oven installation. These advantages can be yours through either specially designed new equipment or conversion of your present layout. There is no obligation to you for recommendations and we invite you to have our field engineer call to analyze your problems at your convenience — or, send us a general description of your requirements stating type of product, present production output, type of paint or other material used, description of plant and present equipment, and any other pertinent data.

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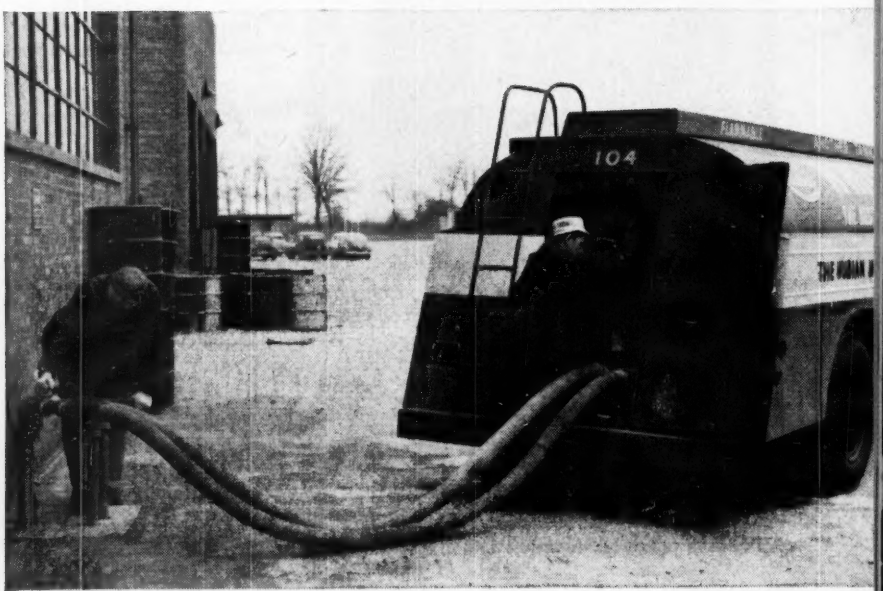
THE NUBIAN INDUSTRIAL DIVISION OF THE GLIDDEN COMPANY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Spotlighting FINISHING Progress

In This Issue:
Sulfamate Nickel Plating
Sulfide-Cyanide Copper Stripping

Sulfamate Nickel Plating

SULFAMIC acid has been known for many years, but was only a laboratory curiosity until about fifteen years ago. It is still not mentioned in most general chemistry textbooks, although since the development of a new manufacturing process in 1938 it has become a commercially important chemical material. The use of sulfamic acid in electrodeposition was recognized more than ten years ago, but little development work has been done on these processes until recently. Since 1949, however, several commercial installations of nickel sulfamate plating processes have been made in electrotyping and electroforming plants and for industrial hard nickel plating; and the process is about ready to spread into the decorative nickel field.

Sulfamic acid is a strong inorganic acid, which is chemically similar to sulfuric acid. The chemists' familiar formula for sulfuric acid is H_2SO_4, which is sometimes written

By Dr. C. Fred Gurnham
Head, Dept. of Chemical Engineering,
Michigan State College

A Monthly Digest of Current Technical Progress Indicating Significant Trends and Developments in the Finishing Industry

AMERICAN CHEMICAL PAINT COMPANY

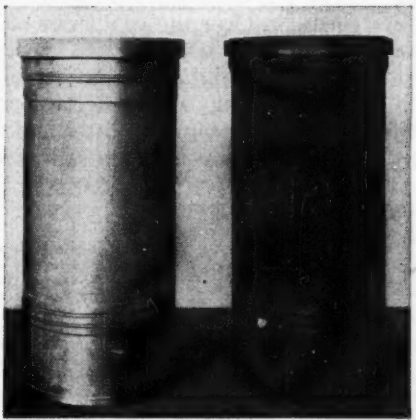
AMBLER CHEMICALS ACP PROCESSES PENNA.

Technical Service Data Sheet

Subject: PROTECTING FRICTION SURFACES WITH THERMOIL-GRANODINE®

INTRODUCTION

Fabricators and product designers, particularly in the automotive field, are aware that even highly polished surfaces under friction weld, gall and score. One of the most inexpensive and practical methods of preventing this is to coat the metal to prevent metal-to-metal contact. With cast iron or steel, the "Thermoil-Granodine" manganese-iron phosphate coating provides a wear-resistant layer of unusual effectiveness.



Thermoil-Granodizing protects the surface of products like the diesel engine liners shown above and the many moving parts of automobiles and other machines. "Thermoil-Granodine" is particularly valuable in these and similar applications because of its ability to retain oil and maintain lubrication under high pressures and high velocities.

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CHEMICALS ACP PROCESSES

WRITE FOR FURTHER INFORMATION ON "THERMOIL-GRANODINE" AND ON YOUR OWN METAL PROTECTION PROBLEMS.

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structurally as: $SO_2 \langle {OH \atop OH.}$ Sulfamic acid has the structure: $SO_2 \langle {OH \atop NH_2,}$ and can therefore be described as amido-sulfuric acid. Sulfamic acid of 100 per cent strength is a crystalline solid. It is quite soluble in water, and is highly ionized to produce a pH similar to that of sulfuric or hydrochloric acids. Sulfamic acid forms highly soluble salts with almost all metals. The acid and its salts hydrolyze slowly in hot water, forming ammonium acid sulfate and similar products. Sulfamic acid and its salts react with nitrous and nitric acids, with aldehydes, and with some amides.

Early reviews on sulfamic acid indicated that smooth, fine-grained electrodeposits of copper, silver, iron, nickel, cobalt, cadmium, zinc, and lead could be obtained from sulfamate solutions. Little research, however, was done in this country on these baths, although F. C. Mathers and his co-workers did report some studies on the electrorefining of lead to the Electrochemical Society. Professor Piontelli of the University of Milan has presented a number of papers on nickel plating from the sulfamate bath, but these articles are in Italian journals which are not readily available in the United States.

A basic patent on the use of sulfamate solutions for the electroplating of nickel, copper, and lead was issued to Martin E. Cupery, and assigned to the Du Pont Company, in 1943 (U. S. Patent 2,318,592). Since 1948, considerable progress in the use of nickel sulfamate plating solutions has been made by Richard C. Barrett of the Barrett Chemical Products Company, of Shelton, Connecticut. Over the past three or four years, Mr. Barrett has installed about 25 of these solutions in the electrotyping and electroforming fields in the United States and Canada, and they have proved success-

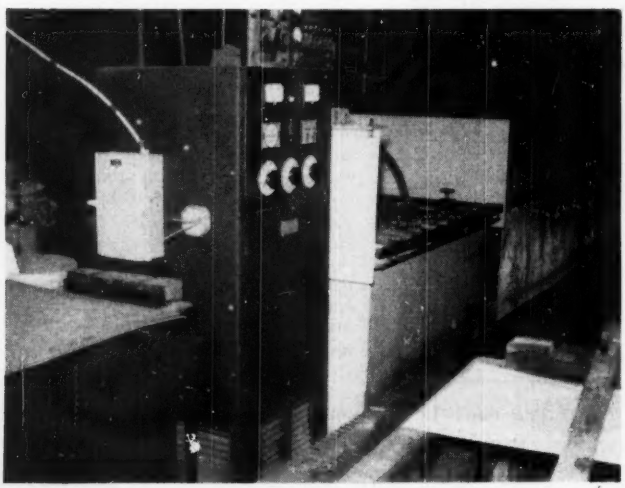

Fig. 1—This view of a nickel sulfamate plating installation at Crescent Engraving Company shows the 2,000 amp., 6 volt Richardson-Allen selenium rectifier used as a current source for nickel sulfamate plating. Partly visible in the left foreground is the cabinet used in applying the silver spray process employed to provide a conductive surface on molds prior to plating. In the right foreground a portion of the agitated dip water rinse tank used to wash molds between the nickel plating and copper plating operations can be noted.

(Photograph courtesy Crescent Engraving Co., Kalamazoo, Mich.)

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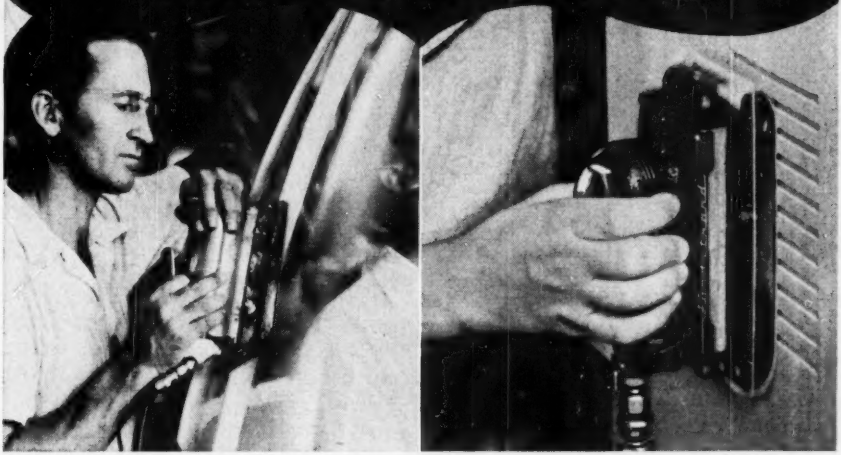

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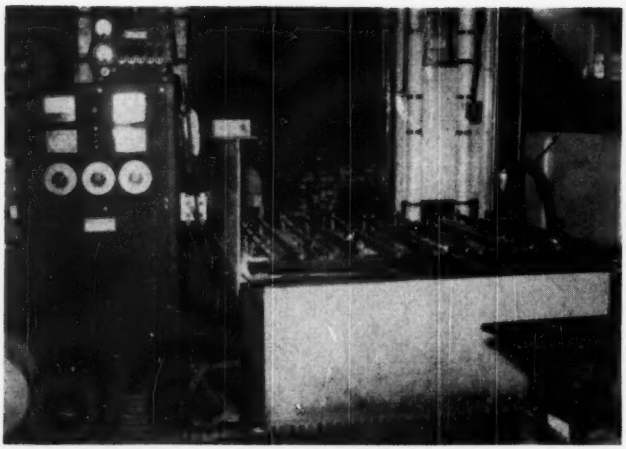

Fig. 2—The 300 gallon nickel sulfamate plating tank shown here is of rubber lined steel construction. The solution is continuously circulated through a heat exchanger to provide controlled temperature and solution agitation—the only solution agitation employed. *(Photograph courtesy Crescent Engraving Co., Kalamazoo, Mich.)*

ful (see Figs. 1-3). Restrictions on the use of nickel for decorative plating have prevented the application of this process in the plating field, but we understand that a bright nickel sulfamate plating bath is available and will be released when conditions justify it.

The literature on sulfamate nickel plating is very brief, and the only recent American articles of any interest have appeared in the "Electrotypers' and Stereotypers' Bulletin." The first of these was by Mr. Barrett, and was presented at the 53rd Annual Convention of the International Association of Electrotypers and Stereotypers, appearing in the "Bulletin" for November 1950. This subject was discussed again by Edward I. Peters in a talk which was published in the November 1952 issue of the "Electrotypers and Stereotypers' Magazine."

Advantages of Nickel Sulfamate

Peters has listed the principal advantages of the nickel sulfamate bath which are of interest to electrotypers, and since many of these concern platers also, they are listed here.

1. Freedom from stress. Nickel deposits from the sulfamate bath are relatively free from internal stress, and hence are less subject to cracking and peeling and the other common defects of highly stressed deposits. Electroplates up to 0.2-inch thickness have been prepared without peeling, lifting, cracking, or splitting from the base, and without the development of nodules or other roughness.

2. High current density. The most important advantage of the sulfamate bath to electrotypers is the fact that it can be operated at about four times the current density of other electrotype nickel solutions. Barrett has recommended 60 asf, and most of the commercial plants are operating at about this figure, with no burning or other deleterious effects.

3. Ductility. Sulfamate nickel deposits have a high degree of ductility, as indicated by the electrotypers' standard test in which the deposit is removed from the base material, creased sharply with the fingernails,

to page 62 →

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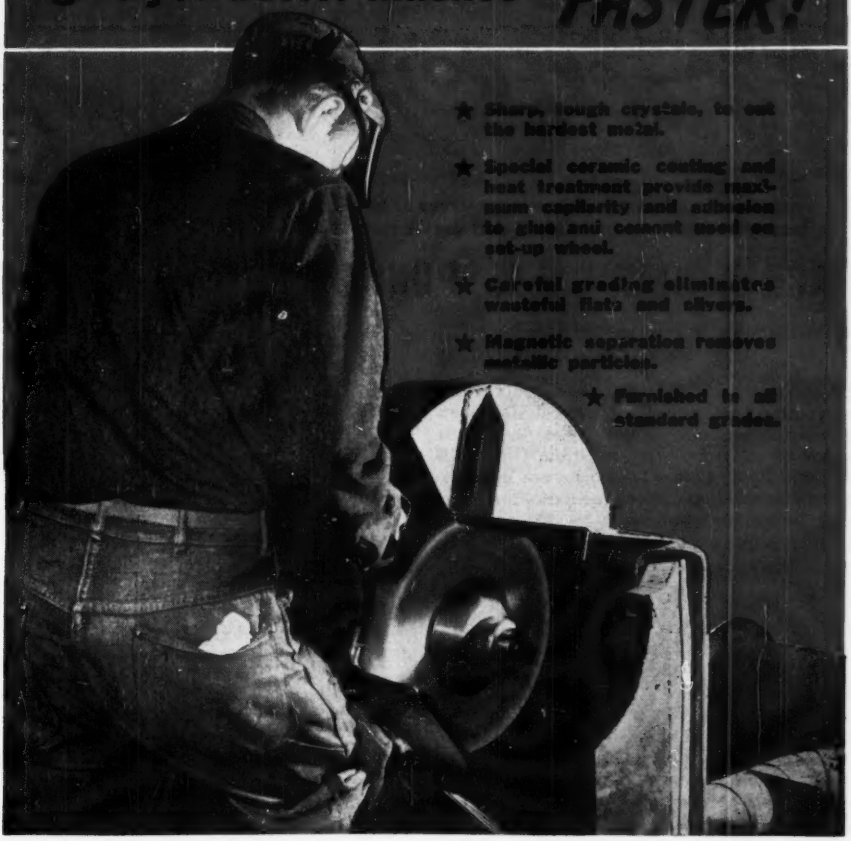
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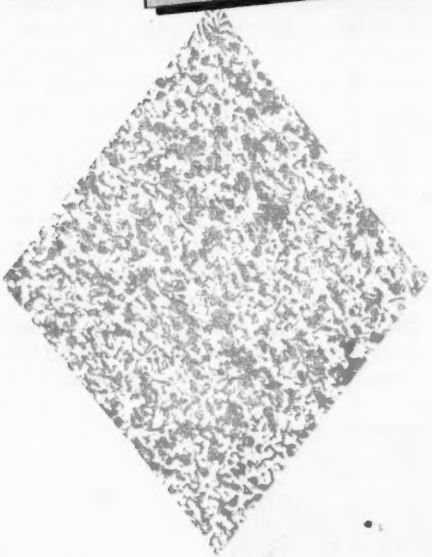

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flattened, and creased in the opposite direction. A good deposit should withstand at least one reverse creasing without visible failure.

4. Simplicity of bath composition. The sulfamate nickel solution contains very few chemicals, and operates satisfactorily over a considerable range of composition. No ammonium or chloride ions are necessary in this solution, although Piontelli's solutions employ small concentrations of ammonium sulfamate and sodium chloride.

5. Control. Because of the simple bath composition, simple control procedures are adequate.

6. Conductivity. The electrical conductivity of a nickel sulfamate solution is high compared to most electrotype nickel baths.

7. Insensitivity to impurities. The sulfamate bath will tolerate relatively large contamination by metallic or organic impurities, and will also resist fungus and other organic growths.

8. Purification. The sulfamate nickel bath is easily purified when necessary, by techniques familiar to the average plater.

9. Temperature range. A considerable variation in temperature is permissible without affecting deposit quality.

10. Wear resistance. The electrotypers' principal concern is to produce a nickel deposit of high wear resistance, in order that long press runs can be obtained. In this respect, nickel from the sulfamate bath is equal to or better than most other electrotype nickel deposits.

Barrett has pointed out other advantages of the sulfamate bath as follows: the nickel deposit has good cold working properties and can be curved, worked, and continuously flexed; the nickel deposit is free from pits, porosity, blisters, craze marks and other blemishes which would be unsatisfactory in an electrotype.

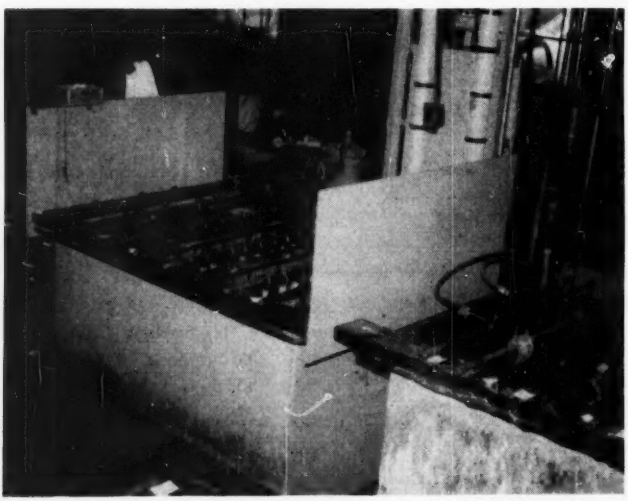

Fig. 3—Another view of the nickel sulfamate plating installation at Crescent Engraving Company, showing (right foreground) a standard acid copper plating tank. Behind the nickel-sulfamate plating tank (center of photo) can be noted an Industrial Filter Type RDR-2, used to filter the nickel sulfamate when such solution maintenance is required.

(Photograph courtesy Crescent Engraving Co., Kalamazoo, Mich.)

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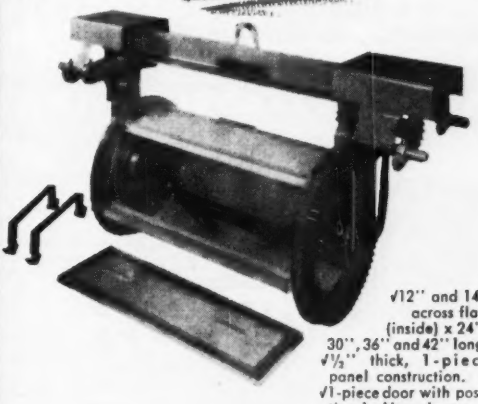

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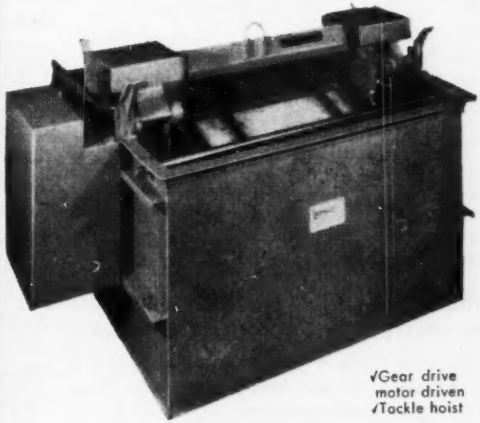

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Bath Composition and Operating Conditions

The control conditions recommended by Barrett and employed in most of the present commercial installations are as follows:

Nickel sulfamate	44.0 oz./gal.
Nickel metal	11.0 oz./gal.
Boric acid	4.0 oz./gal.
Anti-pit agent	0.08 oz./gal.
Buffer	0.25 oz./gal.
pH (colorimetric)	3.2 to 3.9
Temperature	95 to 105 deg. F.
Current density	60 asf
Anodes	99 plus % Ni, rolled depolarized
Agitation	Solution circulation (No air)
Anode: cathode area ratio	1:1
Solution density	31 Baume

Control and Maintenance

Because of the simplicity of the bath, in which nickel sulfamate comprises more than 90 per cent of the dissolved solids, routine analysis need be no more complicated than a hydrometer reading. The accompanying chart (Fig. 4) shows the relationship between specific gravity or degrees Baume at 70 deg. F., and the nickel concentration.

Boric acid control is not critical, and it is sufficient to analyze for this constituent at monthly or less frequent intervals. Standard analytical techniques for boric acid determination may be used. The pH should be checked regularly with a standard color comparator. Adjustment of pH is rarely necessary, and can be made by the addition of sulfamic acid.

Because the nickel sulfamate solution is not sensitive to contamination, maintenance requirements are at a minimum. It is desirable occa-

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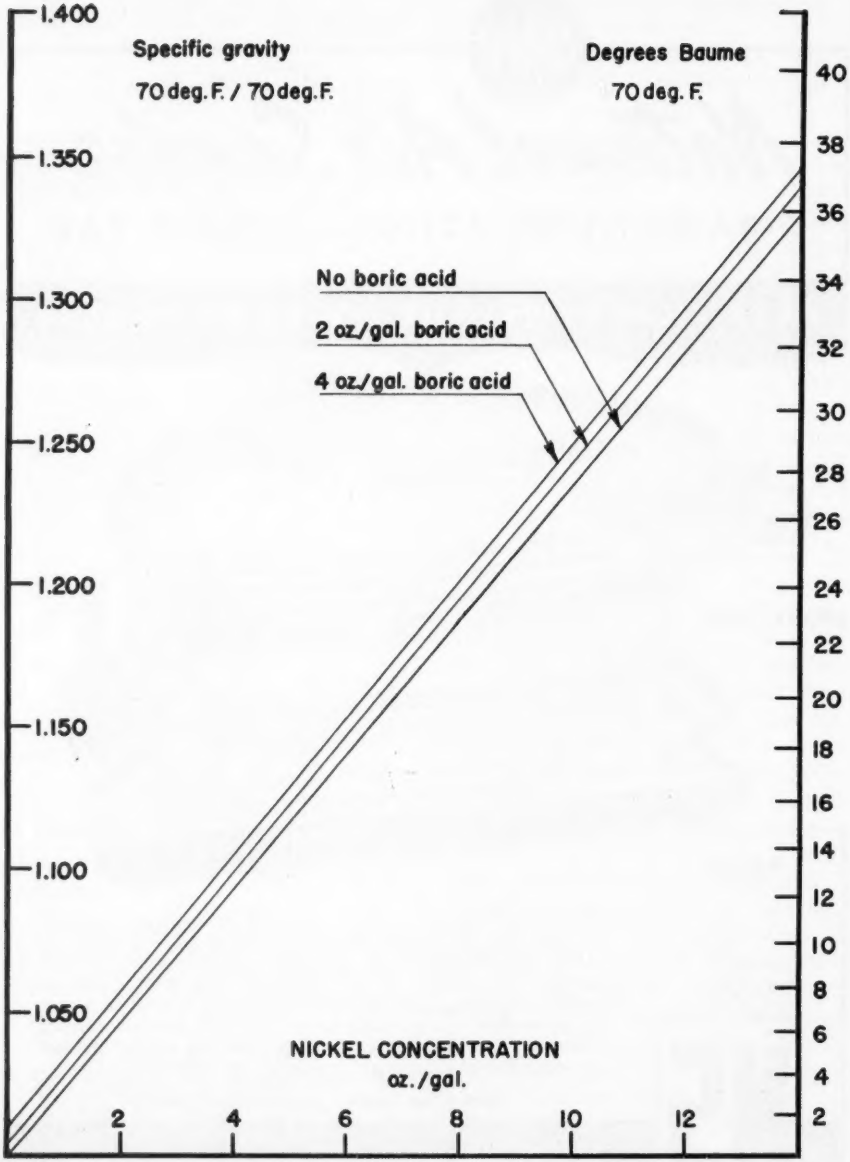

Fig. 4—This chart shows the relationship between nickel concentration in the nickel sulfamate solution and specific gravity as well as degrees Baumé, determined by solution density hydrometers.

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sionally to remove metallic contaminants by low current density electrolysis or dummy plating. This can be done in a special compartment of the plating tank, or in a separate tank included in the recirculation system. Occasional filtration for the removal of solid impurities is recommended. Activated carbon should not be used as it will remove the organic addition agents; however, severe organic pollution can be removed by filtration through carbon, with subsequent replenishment of the anti-pit agent and the buffer.

Equipment Needed

Plating tank. Because of the acidity of the sulfamate bath, all equipment which contacts the solution should be rubber-lined or plastic-lined, or should be of some material which is not corroded. Rubber, Koroseal, and Saran linings on steel are common for the plating tank. A built-in dummy compartment is usually provided, occupying the width of the tank and about one foot of its length, separated from the main part of the tank by an overflow dam.

Agitation. Mild agitation is recommended for the sulfamate nickel plating tank, and is usually provided by external circulation. Air agitation should not be used because the addition agents cause foaming.

Heat exchanger. External heat exchangers are most commonly used, because the solution is circulated to provide agitation also. These exchangers can be made of Karbate, nickel, or stainless steel. Lead cannot be used because of its solubility in the sulfamate solution. The heating and cooling loads are small, and a low-capacity unit is adequate.

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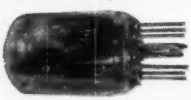

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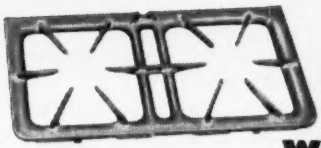

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Circulating pump. The usual recirculation system draws liquid from the dummy compartment of the tank into the pump, and discharges through the heat exchanger back to the plating compartment. Karbate or stainless steel pumps are suitable for this service.

Power source. Any 6-volt power source is satisfactory for sulfamate nickel plating, although higher voltages produce greater current density and shorter plating time. The dummy compartment requires a separate control at lower voltage.

Temperature control. Although the sulfamate bath operates satisfactorily over a wide temperature range, the temperature does have some effect on the deposit, and it is desirable for uniform plating, to maintain thermostatic control.

Anodes. The nickel anodes must be of 99 plus per cent purity, rolled, depolarized. These should be bagged with any standard anode bag which does not contain starch or other soluble organic matter; (Nylon or Vinyon is preferred). Anode corrosion is good without the need of chloride ion; Piontelli recommends 1 to 2 oz./gal. sodium chloride, but this causes highly-stressed deposits.

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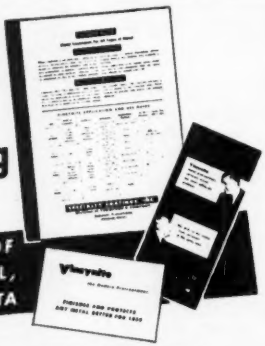

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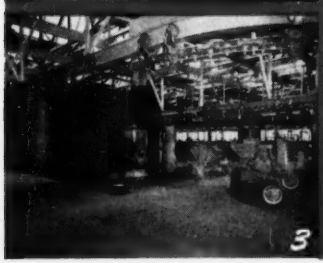
Preparation of Solution

The nickel sulfamate bath can be prepared in the plant from

to page 74 →

DESPATCH



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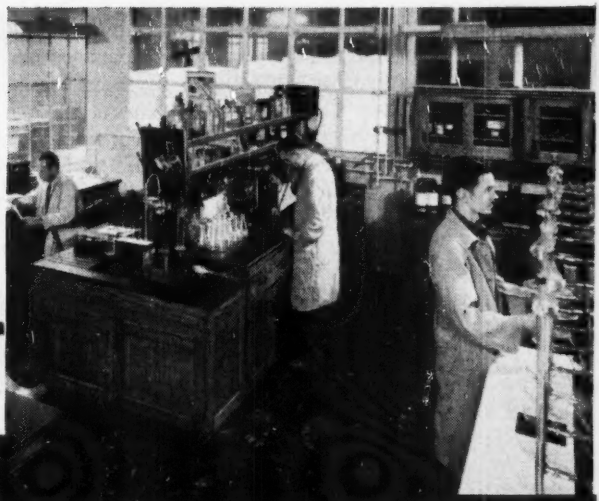

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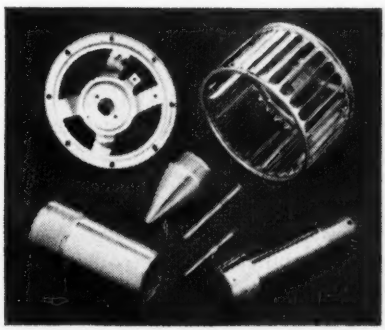

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nickel carbonate and sulfamic acid, although this reaction is slow and requires careful control of conditions to prevent hydrolysis. Extensive purification of the bath prepared in this manner is necessary before use. The purification may require from one day to a week of low-current-density dummying. Expert control is needed in the preparation of these solutions, and all present installations have been supervised by Mr. Barrett. Little technical control is needed once the bath has been made up and started in operation.

A nickel sulfamate concentrate is now available, and this provides a more satisfactory and convenient means of making the plating bath. Only dilution, and perhaps pH adjustment, are required with this technique. A solid crystalline nickel sulfamate is not yet available, but the possibility of preparing such a material commercially is being studied.

The sulfamate nickel plating bath has been received by the electrotypers with considerable enthusiasm, and is also being used in the electroforming of microwave components and other intricate shapes. A modified formula has also been used for preparing extremely hard (550 to 650 Vickers, 6-8 per cent elongation ductility) smooth nickel deposits on propellor blades and industrial parts. These deposits can be made with compressive stress, which serves to increase the fatigue resistance of the base material (steel or aluminum). Since a bright nickel sulfamate bath has been developed and will become available as soon as there is a demand for it, this development is one that should be watched closely by all nickel platers.

* * *

Sulfide-Cyanide Copper Stripping

MOST electroplaters utilize stripping operations principally as a means of salvaging rejected articles. A different application of the stripping operation, of considerable importance in the tool and machinery industries and in some phases of the defense effort, is the stripping of copper which has been used in the selective carburizing of ferrous alloys. The carburizing process is extensively employed to provide a wear-resistant hard surface on steel parts. Frequently it is desirable to harden some parts of the surface and to leave other parts entirely soft. The

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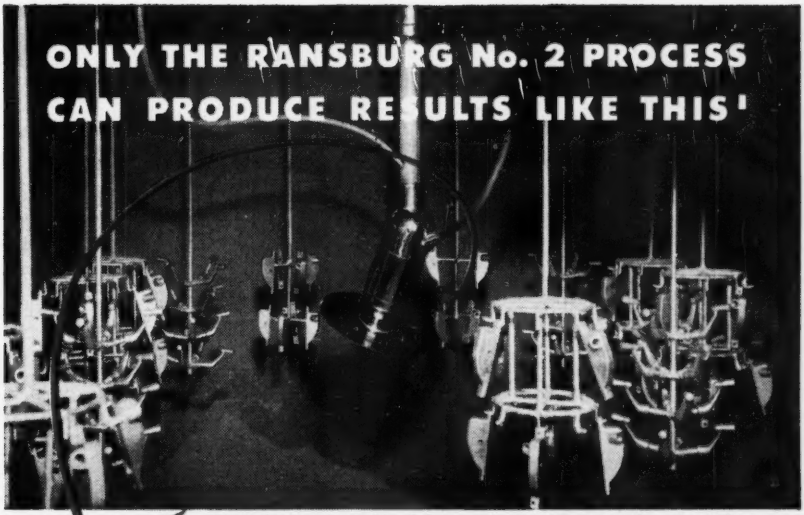

This is the Ransburg No. 2 Process installation in the Standard-Thompson plant, Dayton, Ohio, where electrostatic spray painting eliminated a bottleneck in production of window hardware. The new Ransburg No. 2 Porcess disc-type atomizer is used.

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most common means of achieving this selective carburizing is by copper plating the portion which is to remain soft, and subsequently removing the copper after the carburizing operation.

The copper electrodeposit can be prepared from any standard cyanide bath. It is possible either to plate the entire piece and then to machine or grind off the copper from the areas which are to be hardened, or to selectively plate the article, using stop-off lacquers which are subsequently removed or are burned off during the carburizing operation. The latest edition (1948) of Metals Handbook recommends a minimum copper thickness of 0.0003 inch, but it is common practice to use a 0.0005 inch deposit. This thickness is generally satisfactory for the older carburizing technique of pack hardening, while for gas or liquid carburizing, a copper thickness of 0.001 inch or more is preferable.

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Copper Stripping Methods

Techniques for the removal of copper stop-off electrodeposits after carburizing operations were discussed by Wilfred S. McKeon, president of Sulphur Products Company, Inc., Greensburg, Pennsylvania, at a meeting of the American Electroplaters' Society Syracuse Branch. Sulphur Products Company sponsors the sulfide-cyan-

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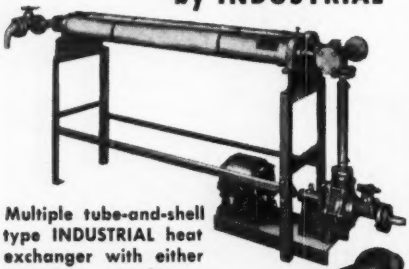

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ide stripping technique, but Mr. McKeon's paper covered other methods also.

Mechanical stripping operations are possible, but are rarely if ever economical. Removal of the electrodeposit in sheet form is not possible, because if the deposit were so poorly adherent as to permit this, it would not have served its purpose during the carburizing process. The copper could be removed by machining or grinding, but this would ordinarily be a laborious task; also the proximity of the copper to the hardened surface would result in rapid wear of the tools. Generally, the stripping process is carried out by a chemical or electrochemical operation.

In chemical and electrochemical stripping, a solution must be provided which will attack and dissolve the copper, but which will not affect the ferrous alloy unfavorably. The development of such a solution is not an easy task, especially since the base metal is apt to vary in composition from lot to lot, or even from one spot to another on its surface. Too active a stripping agent will produce pits in such surfaces.

Cold concentrated nitric acid can be used as a stripping agent in some cases, but only on certain types of alloy steels and rough castings. The acid must be maintained cold and concentrated in order to prevent oxidizing attack on the steel. This process is not popular because of the danger of attack on the base metal.

Chromic acid stripping solutions for copper can be used either with reverse electric current or as immersion dips without current. The immersion technique is the slower, and

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is suitable for objects which can be left in the solution without attention for an extended period of time; but it is too slow usually to be utilized in a normal production cycle. The reverse current deplating is a more rapid process, but the material must be removed from the solution as soon as the reactions are complete.

Cyanide baths, like the chromic acid solutions, can be used either with electric current or as immersion dips. Even with reverse current, the cyanide stripping is slow unless very exact voltage control is provided. Reverse current stripping with sodium or ammonium nitrate solutions is used in some plants and gives excellent service; but other plants have had trouble with crystal formation on the surface being stripped. The formation of such crystals prevents removal of copper from those areas, and also causes deep pitting or etching at the crystal boundaries.

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Sulfide-Cyanide Stripping

Among the advantages of this process is the safety in handling sulfide solutions, as compared to most other stripping solutions. Another important factor in the polysulfide or sulfide-cyanide stripping technique is the absence of attack on the ferrous base metal. Even after several hours in the sulfide solution, there is no noticeable etching or pitting, and no embrittling effect.

The sulfide-cyanide stripping cycle consists of immersing the part in an oxidizing sulfur bath for the appropriate length of time, rinsing, spraying to remove as much as possible of the flaky copper sulfide, and dipping in a sodium cyanide bath to remove the remainder of the sulfide layer. This cycle is repeated as often as is necessary to remove the copper completely from the piece. Each cycle will remove from 0.001 to 0.0013 inch of copper, and requires about fifteen minutes. A single cycle is therefore adequate for most carburizing stop-off copper and for decorative copper plate.

In operation, the polysulfide solution converts the copper metal into copper sulfide, with the solution gradually becoming depleted in its sulfur content. Theoretically, one pint of the commercial polysulfide solution will dissolve approximately one pound of copper, or the equivalent of a 0.001 inch deposit over a 3000-square inch area. A further advantage of the polysulfide solution is that there is little decrease in its activity down to 60 per cent exhaus-

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tion, while the chromic acid strip is noticeably slower at 45 per cent exhaustion, and the sodium cyanide strip at 25 per cent. There is no build-up of impurities in the polysulfide solution, and it can be regenerated by chemical additions.

Theoretically, complete solution of the copper electrodeposit can be achieved by allowing adequate reaction time. In practice, however, the rate of penetration decreases after about two minutes, and it is more efficient to remove the sulfide coating at that time. In production, it is generally recommended that the immersion time be between two and five minutes, depending on the size of the piece and the bath temperature. In baths operated at room temperature, the polysulfide dip can be completed in about two minutes; but the combination of high temperature baths and large pieces of work requires the longer time in order for the work to reach bath temperature. Generally either the two-minute or the five-minute immersion can be adapted to the operator's time cycle without inconvenience.

The polysulfide concentration can be varied over rather wide limits, from full commercial strength to as dilute as 25 per cent or less. Full-strength solutions produce a somewhat slower penetration than moderately diluted solutions; on the other hand, too much dilution results in the formation of adherent sulfide deposits. It is recommended, therefore, that a moderately concentrated solution be maintained, especially since such maintenance is simple and not wasteful of chemicals.

An oxide coating on the copper metal makes the deposit more resistant to attack by the polysulfide solution, and it is recommended that a brief preliminary dip in cyanide solution be provided to remove such films. A ten-second immersion in the same cyanide solution that is used to remove the last traces of copper sulfide is usually adequate for destroying these oxide films.

The sodium cyanide bath which is used for final purification and removal of copper sulfide becomes gradually reduced in its efficiency by carryover of sodium sulfide or polysulfide. Thorough rinsing between these two steps is important. A strong spray rinse also serves to flake off and remove a substantial portion of the copper sulfide adhering to the metal, and hence provides a further economy in cyanide consumption.

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The carryover of sulfide chemicals to the cyanide bath results in conversion of the cyanide into a thiocyanate (NaCNS), which is of no value as a stripping agent, although its presence in reasonable amounts does not interfere with the stripping action of the cyanide.

The most satisfactory cyanide solution has a concentration of about one pound of sodium cyanide per gallon. Stronger solutions will produce more rapid penetration, but may also cause etching of the base metal, particularly at high temperatures. The life of the cyanide bath seems to be dependent more on the temperature of operation than on the amount of work processed, since at elevated temperatures there is a tendency for sodium cyanide to hydrolyze and decompose. The temperature should therefore be kept as low as possible, while still maintaining the operating cycle desired. The life of the cyanide bath can be extended by the addition of a small amount (2 oz./gal) of sodium hydroxide, probably because this reduces the rate of hydrolysis of cyanide.

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It should be emphasized again that the most efficient utilization of chemicals results from as thorough a mechanical removal of copper sulfide as is possible. The use of a strong water jet in the rinsing operation has been mentioned; other techniques which may be suitable include hand-brushing, air-blasting, or tumbling. The success of any of these methods depends on the sulfide film being relatively non-adherent, a condition which is achieved by polysulfide treatment at high temperatures and at the greatest concentration which still permits efficient penetration (two parts of commercial concentrate to one part of water).

Polysulfide stripping of copper deposits is employed in many plating establishments, not only in the selective carburizing process, but also for many other applications. The principles outlined above are applicable to any of these, and should help the plater reduce chemical consumption and operating costs.

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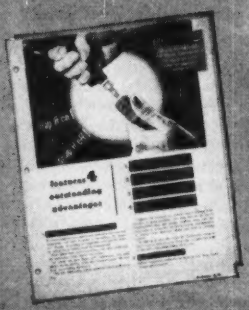

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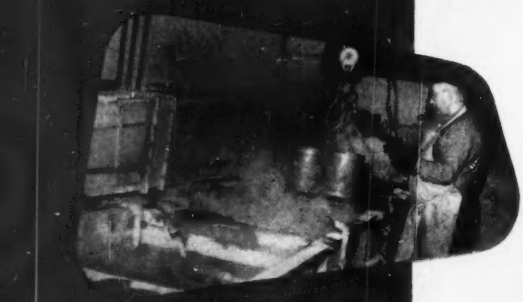


Nickel-Lume Bright Nickel Process

Hanson-Van Winkle-Munning Co., Matawan, N. J., has announced the development of a new bright nickel process called Nickel-Lume. The new organic-type process is said to produce better and brighter nickel coatings, and is marked by economy of operation and ease of control.

Equipment suitable for a Watts nickel bath is satisfactory. Ordinary auxiliary equipment may be used, filtration may be either periodic or continuous, ventilation is not required and heat demands are up to 25 per cent lower.

Characteristically, deposits with the Nickel-Lume process have:

1. A bright white color. The deposits approach the whiteness of the well-known cobalt-nickel deposits.

2. Well-leveled surfaces. Nickel-Lume reduces surface roughness by 50 per cent and over. This cuts down or eliminates polishing or buffing operations.

3. Low internal stress. To prevent cracking, crazing and lifting of deposits, the compressive or tensile stress in these deposits may be easily controlled.

4. Good ductility. In comparative nickel tests, Nickel-Lume foils have shown surprising ductility, which continues after the bath ages.

5. Highly active surfaces. Deposits accept chromium without any activating treatment.

Nickel-Lume baths may be operated from room temperatures up to or be-

yond 140 deg. F. with full deposit brightness. With moderate to high current densities, a temperature beyond 120 deg. F. is seldom required.

Current densities may be varied from 5 asf to above 70 asf. Because of this wide range, uniformly bright deposits may be plated on intricately-shaped articles, and plating speed may be changed to meet various specifications and production schedules.

Nickel-Lume, which has been thoroughly production tested on both automatic equipment and in a job shop, has a number of processing advantages.

1. No batch purification treatment is needed under good average operating conditions, because the addition agent in the process does not break down into harmful products.

2. Thin deposits are bright. Nickel-Lume also builds brightness—the thicker the deposit, the brighter the finish.

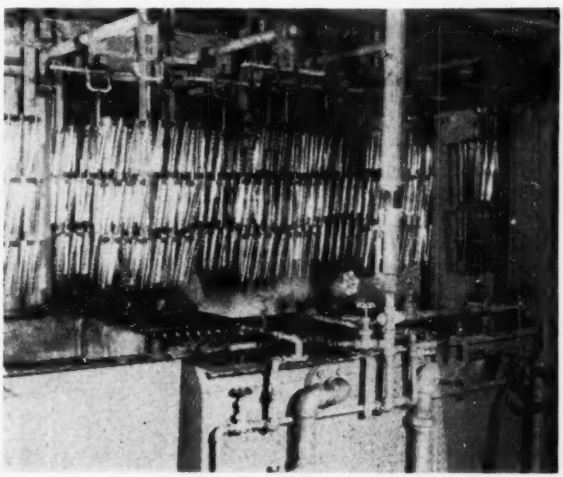
3. Surface preparation is held to a minimum. With a high tungsten, No. 3 finish, cold-rolled steel, for instance, no polishing or buffing is necessary. Bright, stable finishes may be plated on the raw steel.

4. Reject-stripping costs are low, while rejects are few. In one commercial installation, stripping of rejects, caused by mishaps in racking, proved unnecessary. Rejects were simply double plated.

5. Baths have high tolerance to impurities. Should either organic or inorganic contamination reach abnormal levels, most common purification treatments will effectively decontaminate the bath.

6. Process is easy to control. All constituents of the bath including addition agents may be determined and controlled by chemical analysis.

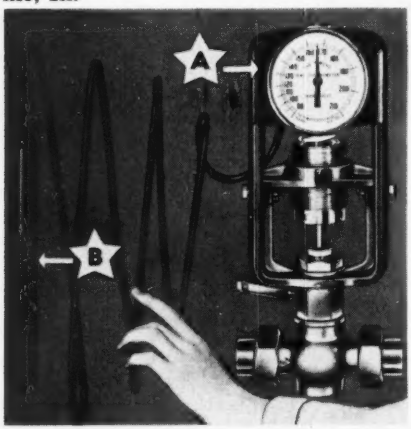
7. Uses regular non-premium nickel anodes.



Nickel-Lume Plating Installation

Temperature Regulator

Manufacturer: The Powers Regulator Company, 34PF Oakton St., Skokie, Ill.



Powers No. 11-MF Self-Operating Regulator

Powers No. 11-MF Self-Operating Regulator accurately maintains various plating solutions at whatever constant temperature is desired. Also used for anodizing, phosphatizing, cleaning, pickling, rinsing, washing and degreasing processes.

An easy to read 4-inch dial thermometer (A) indicates temperature of solution being controlled and makes it easy to adjust regulator for any temperature desired. Thermometer and regulator operate from the same bulb.

Plastic covered thermal bulb and tubing (B) will stand up in all solutions for above uses. Plastic coating also prevents short circuits and thus avoids need for insulation.

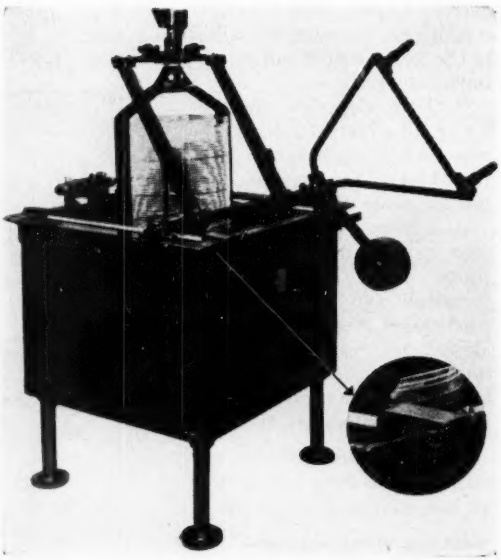
Temperature ranges: 110-155 deg. F. and 145-205 deg. F. Standard lengths of tubing: 8 and 15 feet. Valve sizes: ½ to 1½ inches. Regulator has double union bronze body and built-in valve stem lubricator. Fully described in Bulletin 330.

Insulated Anode Rod Support

A new type of anode rod support, which provides permanent insulation of anode rods from plating tanks, has been developed for an improved model of the Daniels Type OLS barrel by Daniels Plating Barrel & Supply Co., 129 Oliver St., Newark 5, N. J.

This support, which is now being used on all Type OLS barrels, in addition to the permanent insulating feature, also offers the advantages of simple replacement and greater current carrying capacity.

The permanent insulation is achieved



Daniels Type OLS Plating Barrel equipped with insulated anode rod support.

Youngstown. The 1,150-

al relining.

of the 25 district furnaces in mobile

N.J.M. Announces the Availability of Non-Allocated Nickel Anodes!

Manufactured from Grade "A" Scrap Under A.S.T.M. Specification B-39-22

ELIZABETH, N. J.—It was announced by Mr. A. Kerzner, vice president of New Jersey Metals Company, Elizabeth, N. J., that, as a result of increased plant facilities, his company is now in a position to supply non-allocated, standard oval shaped nickel anodes in substantial quantities. Heretofore, the bulk of the company's nickel anode production has been confined to a reconversion service of anode ends and stubs to new anodes.

In reply to questions concerning the procurement of the nickel, the comparative costs and the quality of the scrap nickel anodes, Kerzner stated that his company buys pure nickel scrap at the current scrap market price, melts and casts it in their own foundry, and sells it at cost plus the standard casting fee.

Insofar as comparative costs between new and scrap nickel anodes, the latter is more expensive but not prohibitively so. Actually, the price of the scrap nickel anode is in direct proportion to the price necessary to buy the scrap. The casting fee remains the same regardless.

The quality of scrap nickel anodes measures up to the finest new nickel anodes on the market and are guaranteed as such by New Jersey Metals Company.

Kerzner further stated that for the past six months extensive tests have been made by some of the largest plating plants in the country, and in each case the report has been highly favorable.

NEW YORK, Aug. 24.—The Iron and Steel Institute

Call
Elizabeth 2-6465
or wire immediately for prices and complete information.
New Jersey Metals Co.
Serving industry from coast to coast since 1920
710 ROCKEFELLER ST., ELIZABETH 2, N. J.
N.J. METALS

since the support requires no holes and is held in position by a set screw (see illustration showing front end of the support). The back support (not shown), which is larger, is adapted for fast, easy connection to a bus bar.

Complete information on this improvement and its applications is available from the manufacturer.

Harco Safety Solvents

A series of safety solvents for cleaning greasy, oily, dirty machine parts has been developed by Harco Chemical Co., 338 North Ave. E., Cranford, New Jersey. The Harco series present a wide spread selection with flash points ranging from 140 to 280 deg. F.

Any one of the series is recommended for degreasing and cleaning of electrical equipment and all metal parts. The solvents dry fast, leaving no deposit.

Technical bulletins giving complete specifications are available.

Corrosion Resistant Heat Exchanger

A standard line of pressure heat exchangers designed to pass corrosive liquids or gases under pressure at high temperatures through tubes or shell has been announced by Haveg Corporation, Newark 67, Delaware.

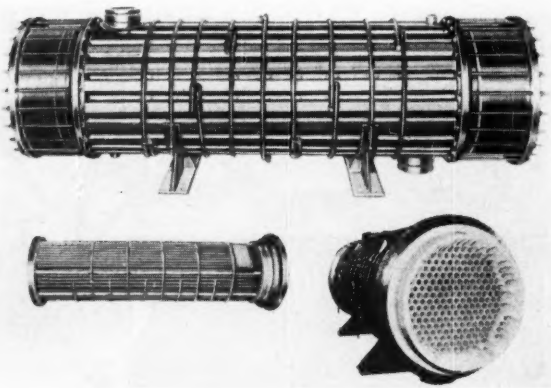
Molded from Haveg, an acid-digested asbestos bonded with synthetic resins, the line offers distinctive advantages in extended service life and resistance to corrosion, according to C. R. Runk, Haveg sales manager.

Standard pressure sizes range from 13¼ to 29¼ inches inside diameter with single or multi-pass interchangeable heads. Since the material is molded, larger sizes up to 10 feet in diameter can be made for coolers and low pressure heat exchangers.

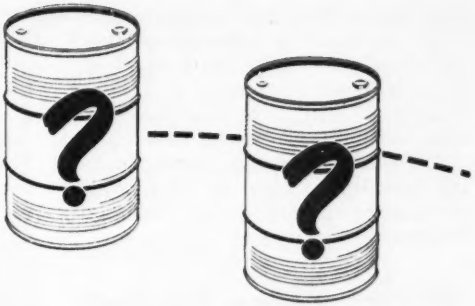
Pressure ranges of the new standard line are from 50 to 75 p.s.i. with a wide margin of safety. Haveg is resistant to thermal shock and can safely be used continuously up to 265 deg. F.

Construction of the new standard line includes an outer shell, fixed and floating tube sheets 2½ inches thick, heads, baffles, and impingement plates all of Haveg. The outer shell is reinforced with wood staves and steel hoops. Many types of packing are available, and gaskets of Neoprene, Teflon, rubber, or asbestos composition may be supplied to seal off the tube sheets. Auxiliary equipment, such as pumps, valves, pipe and fittings can be supplied in special corrosion-resistant Haveg grades.

Backed by twenty years' experience in molding corrosion-resistant equipment for chemical process indus-



Side and end views, (top and lower right) show external construction of corrosion resistant standard pressure heat exchanger. A typical tube bundle for the unit is shown at lower left.



How do you choose a degreasing solvent?

Brand name and its significance should govern your choice. Today thousands of manufacturers specify "Triclene" D trichlorethylene because they know *that* brand name stands for highest quality. They know, too, that "Triclene" D is made by Du Pont—pioneer manufacturer of degreasing fluids with a long record of service in the metal cleaning field.

Over twenty years of experience stand behind each drum of "Triclene" D. This experience includes not only laboratory research, but a thorough knowledge of the needs of industry as well. "Triclene" D reflects this background. It is stable and pure. It is the best degreasing solvent Du Pont has ever made!

You'll find it pays to be brand-conscious in your choice of degreasing solvents. So be sure of the best... ask for "Triclene" D. And for expert advice on metal cleaning problems, just get in touch with our nearest district office. Du Pont service men are always ready to help you.

DISTRICT OFFICES: Boston • Charlotte • Chicago • Cincinnati Cleveland • Detroit • El Monte (Calif.) • New York • Philadelphia

DU PONT
first in solvents for
VAPOR DEGREASING

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Please send me the literature checked below:

- ☐ "How trichlorethylene is used in metal cleaning".
- ☐ "Triclene" D — an improved vapor degreasing solvent.
- ☐ "Metal degreasing — standard practices."
- ☐ Du Pont publication, "MODERN METAL FINISHING". (Please add my name to the mailing list).

NAME..... POSITION.....
FIRM.....
ADDRESS.....
CITY..... STATE.....

tries, Haveg Corporation plans to market the standard line either through leading suppliers of heat exchange equipment or direct. Customers' designs can be adapted easily to molded Haveg construction with any type of tube bundle.

Complete descriptive matter, including blueprints, may be obtained by writing Haveg Corporation, Newark 67, Delaware.

Chrome Yellow Pigments

Three new chrome yellow pigments, Light Lemon 12158, Medium 12152 and Medium 12157 have recently been made available by the Pigment, Color and Chemical Division of the Sherwin-Williams Company.

CP Chrome Yellow Light Lemon 12158 is a new lemon yellow in the extra light range with the ultimate in light resistance for lemon yellows. It is expected to find wide acceptance in combination with blue pigments to make clean greens of good light resistance. Since 12158 is considerably lighter than standard lemon yellow, the resultant green produced is somewhat cleaner than when standard lemon yellow is used.

CP Chrome Yellow Medium 12152 is characterized by good light resistance, high strength, clean shade, high hiding power, low oil absorption and freedom from bleed in all types of vehicles. Due to its all-around good properties, 12152 is suitable for a wide variety of applications in all industries which consume color pigments, with the exception of those requiring lead-free formulations.

CP Chrome Yellow Medium 12157 is a new medium yellow containing 98.0 per cent minimum lead chromate content and especially designed for use in Federal Specification TT-E-4856, "Enamels: (for) Drums and Other Metal Products, Rust Inhibiting." Since TT-E-4856 specifies the minimum content of lead chromate as well as lead and chromium as determined by chemical analysis of the finished enamel, a definite saving in pigment cost can be made by using 12157.

Bulletins describing these colors in detail as well as samples can be obtained by writing the PC&C Division. The Sherwin-Williams Co., 300 West Lake St., Chicago 6, Ill., or 100 Park Avenue, New York 17, N. Y.

Conveyor Oven

Conveyor equipment was once an incidental in oven equipment manufacture. Now it is often of equal importance with the oven itself. For instance, a recent installation for a leading motor car manufacturer bakes the finish on car heater motors, also conveys and rotates them while they are passing through water wash spray booths.

All conveyor equipment was designed and supplied by the oven manufacturer. It is flexible so that parts may be given any one or all of three different paint finishes on the same conveyor line.

Conveyor Oven Installation

HARSHAW ANODES and CHEMICALS

You can depend on Harshaw products to keep your production moving. For more than fifty years we have concentrated on improving the quality of the anodes and chemicals used by platers.

NICKEL PLATING

. . . still and barrel . . . nickel anodes—all commercial grades and sizes . . . anode bags . . . single nickel salts—nickel chloride . . . nickel carbonate . . . nickel fluoborate . . . boric acid.

CHROMIUM PLATING

. . . pure "Krome Flake" 99.8% CrO_3 . . . sulphates less than .10% . . . lead, tin-lead and antimony-lead anodes.

COPPER PLATING

. . . copper ball anodes . . . Rochelle Salts . . . sodium and copper cyanides . . . copper sulfate . . . copper fluoborate.

CADMIUM PLATING

. . . ball and cast cadmium anodes . . . cadmium oxide . . . sodium cyanide . . . cadmium fluoborate.

TIN PLATING

. . . cast tin anodes . . . sodium stannate . . . stannous sulfate . . . tin fluoborate . . . acid tin addition agent.

ZINC PLATING

. . . ball and cast zinc anodes . . . sodium and zinc cyanide . . . zinc sulfate . . . zinc fluoborate.

LEAD PLATING

. . . cast lead anodes . . . lead fluoborate.

SILVER PLATING

. . . silver cyanide.

The HARSHAW CHEMICAL Co., Cleveland 6, Ohio

Chicago 10, Ill. • Cincinnati 13, Ohio • Detroit 28, Mich. • Houston 11, Texas
Los Angeles 22, Calif. • Philadelphia 48, Pa. • Pittsburgh 22, Pa. • New York 17, N. Y.

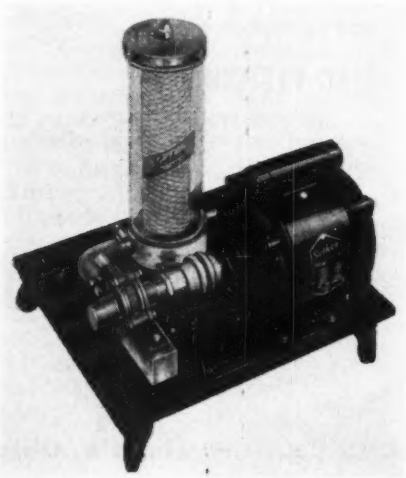
After the final bake, parts travel to a cooling chamber where they are restored to room temperature before unloading for inspection and packaging.

Information and literature about the automatic handling of parts through ovens is available from Michigan Oven Company, 415 Brainard, Detroit 1, Michigan.

Self-Priming Filter Pump

Sethco Mfg. Co., 70-72 Willoughby Street, Brooklyn 1, N. Y., has reported the addition to its line of filter pumps for filtering corrosive solutions, of Models LSIN-5 and LSIN-10. Filters practically any acid or alkaline solution from pH 0 to pH 14; may be used for filtering non-aqueous solutions. Filter will remove particles down to 1 micron in size. Strainer stops metallic objects.

Pump is self-priming and has a suction lift of approximately 15 feet. Pump is fabricated of stainless 316 and has a neoprene impeller. Pump will deliver 6 gal./min. on open pumping and will develop 40 p.s.i. before shut off. Filter assembly is fabricated of high temperature Lucite and is also available in Haveg, stainless 316, rubber lined or epoxy resin construction. Filter tubes can be had in cotton, Dynel, porous stone or porous carbon. Cotton or Dynel yarn is wound around a stainless steel supporting core or perforated bakelite tube to give a ¾ inch thick wall of inter-laced filtering cylinders. Channeling or rupturing is entirely eliminated by the heavy wall of yarn surrounding the core. Filtration is in depth and is not a surface operation. The size of particles to be filtered out, can be controlled from 150 microns down to 1 micron size by varying the density of the mesh of cotton or Dynel wound on the supporting core. Cotton is recommended for filtering dilute non-oxidizing acids, bases and most non-aqueous solutions.



Sethco Model LSIN-10 Filter Pump

Dynel is recommended for filtering concentrated oxidizing and non-oxidizing acids as well as for concentrated alkalis. Porous stone filter tubes are recommended for all concentrations of acids except hydrofluoric acid. Porous carbon filter tubes are recommended for all concentrations of alkaline solutions.

Motor is ¼ h.p., 110 volt, 60 cycle, single phase, capacitor start, totally enclosed, ball bearing. Motors wired for 50 cycles and for 220 volts are also available.

Filter, pump and motor are mounted on Bakelite panel. Pure gum inlet and outlet reinforced hose supplied. Model LSIN-5 panel equipped with rubber feet. Model LSIN-10 panel equipped with rubber ball bearing casters.

Pyrolock

A quick-drying material that can be sprayed like paint on metal, making the treated surface capable of withstanding temperatures as high as 5000

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The benefits of constant research:

No Parker Product is ever regarded as "perfected." Our research staff is constantly working for improvements—in simplicity, economy and effectiveness. New ideas are field tested, and passed on to Parker customers.

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Among the thousands of applications on all kinds of metal products in all types of plants, Parker experience has already met and solved a metal surface treatment problem like yours. Our experience can save you time, money, and trouble.

The benefits of superlative field service:

The Parker technical representative who lives near you is qualified to give you immediate, expert attention. He brings the knowledge and experience of this whole organization to your plant.

The benefits of precisely controlled manufacture:

Quality controls are rigidly maintained in the manufacture of Parker Products. You get uniform, dependable results from uniform, dependable Parker Products!

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Since 1915—leader in the field

Parker RUST PROOF COMPANY

2172 E. Milwaukee, Detroit 11, Michigan

BONDERITE corrosion resistant paint base

BONDERITE and BONDERLUBE aids in cold forming of metals

PARCO COMPOUND rust resistant

PARCO LUBRITE wear resistant for friction surfaces

deg. F. has been developed by The B. F. Goodrich Company, Akron, Ohio.

Called "Pyrolock," a one-sixteenth inch coating of the new insulation protects metal for as long as ten seconds against flame temperatures hotter than the melting point of metals.

Announced by Clyde O. DeLong, president of the rubber company's Industrial Products Division, Pyrolock is described as "a water base inorganic material unique in the field of thermal insulation." The material was developed at the request of the Defense Department for use in the rocket and guided missile field. Laboratory tests conducted over a two year period indicate that the new material resists higher temperatures for longer periods than any other preparation available for use in that field.

According to Mr. DeLong, Pyrolock is non-toxic, non-flammable, non-explosive and will adhere directly to clean metal surfaces without sandblasting or use of priming surface preparations. The dried layer of Pyrolock bonds itself to metal with a strength that withstands sharp impact short of actual deformation of the base metal. Resistant to most solvents and chemicals, the material also withstands indefinitely temperature cycles of minus 60 deg. F. to plus 165 deg. F.

Looking toward the potential use of Pyrolock in industry, Mr. DeLong says that the present material can be easily modified for use anywhere where resistance to flame and high temperatures is needed. A modified version of Pyrolock for broader use in industry would provide for adhesion to many types of surfaces, withstanding water, acids, alcohol and the effects of weather.

Electroplating Prior to Galvanizing

Electroplated films may be used to improve the process of hot galvanizing strip steel by protecting the treated surfaces of the steel prior to coating. This is the opinion of Allen T. Baldwin, Hanson - Van Winkle - Munning Co., Matawan, N. J., who has completed experimental studies on hot galvanized coatings.

Any steel surface must be completely free of oxide and non-metallic materials before galvanizing. If it is not, molten zinc will not alloy with the ferrous surface. Surfaces can be freed of iron oxide by ordinary pickling. But under ordinary conditions, particularly where continuous methods are in use, iron surfaces tend strongly to reoxidize.

In this test, the untreated steel panel at right burned through in less than a second under an oxy-acetylene flame at approximately 5,000 deg. F. As this photograph was taken, the treated steel panel at left was unharmed after four and one-half seconds exposure to the same flame. Timing the test is Donald V. Sarbach, inventor of Pyrolock and manager of The B. F. Goodrich Company's general chemical laboratories, Akron, Ohio.

Cleaning Specialists

SERVING YOU SINCE '32

Top manufacturers, who know the value of good cleaning, know they can find the right process for preparing any metal surface for finishing at Northwest—

- **LO-HI pH PROCESS—for cleaning prior to plating, painting, or porcelain enameling.**
- **ALKALUME PROCESS—for preparing aluminum for finishing and spot welding.**
- **INTERLOX PROCESS—for phosphate coating.**
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- **PAINT STRIPPERS—specific to your needs.**
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Get Northwest's specialized products plus "job-focused service" for all your cleaning needs.

NORTHWEST CHEMICAL CO.

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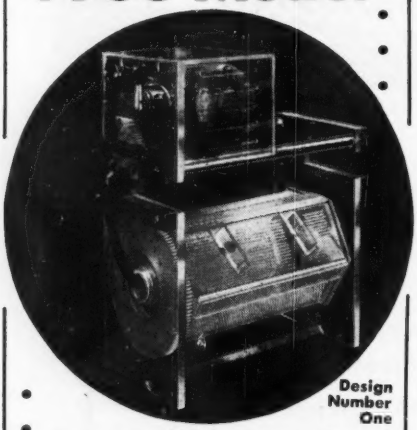
It's New -- the 1953 Model



Design Number One

Portable Lucite Plating Barrel

THE STUTZ PORTABLE PLATING BARREL is designed and constructed of High Temperature Lucite to provide continuous processing of piece parts through the operations of Alkali Cleaning, Water Rinsing, Acid Treatment and Plating. Progression through these operations is made by manual handling or if necessary with the assist of an overhead traveling hoist. The STUTZ PORTABLE PLATING BARREL is made in two sizes with cylinders having inside dimensions of 6" x 12" and 8" x 18". Also in half the diameter, 3" and 4" respectively. Cylinder can be partitioned. Standard perforations are 3/32" or larger. Smaller openings can be furnished as required. All gears are ½" High Temperature Lucite. Gear bearings are permanently lubricated. New heavy duty motor. Operating temperature up to 185° F.

Write for Our New Illustrated Literature Showing This and Other Design Arrangements.

Manufactured by

GEO. A. STUTZ Mfg. Co.

1647 Carroll Avenue, Chicago 12, Ill.

"We've found," Mr. Baldwin explained, "that a film of non-ferrous metal plated to the ferrous surface can retard, and possibly prevent the formation of any iron oxide on the surface. The film itself might oxidize, but these oxides would not have as harmful an effect."

Examined in the experiments were thin platings of iron, zinc, tin and nickel. Of these, nickel only seems to have introduced a different structure over that obtained with platings on the regular steel base. The other metals plated showed some influence on the amount of the distinct phases, rather than the character of these phases.

Inserting this electroplating step into a hot galvanizing process would not be a complicated or costly problem for the galvanizer, Mr. Baldwin stated. The galvanizer would have to purchase electrical equipment, anodes and a plating tank, if he didn't already have them. There is a real possibility that the plated film could be put on without an external voltage.

Preliminary electroplating would be especially adaptable to the continuous hot galvanizing of strip steel. With strip steel, immersion time in the zinc kettle is shorter than usual, which means that the steel has to be pre-heated. Pre-heating in turn calls for maintenance of steel surface, a problem that electroplating apparently solves.

BurrMaster

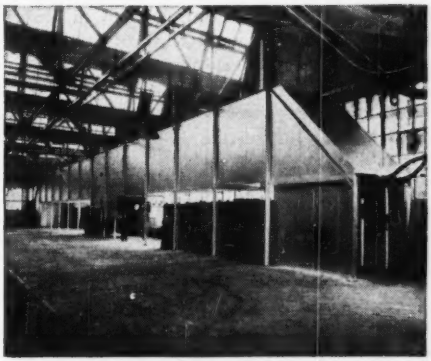
Development of a deburring barrel has been announced by the White-Roth Machine Corp., Lorain, Ohio. Known as the BurrMaster, the barrel tumbler removes welding slag, flame cutting slag, burrs and rust from weldments and machined parts. Actual time study records show that the majority of items processed can be deburred in one third the time necessary to process by hand. Removal of welding and flame cutting

A *LOT MORE* THAN FANS, DUCTS, HEATERS, AND PANELS

GO INTO

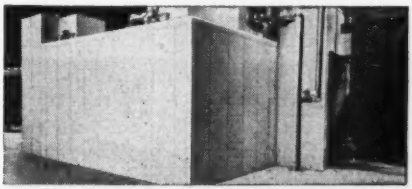
LANLY
FINISHING OVENS

● The proper adaptation and utilization of the essential component parts in every LANLY OVEN for maximum operating efficiency and economy, is a certainty being demonstrated every day in factories throughout the country. Specialized knowledge evolved from long experience and close cooperation with our customers enables us to design and erect better finishing ovens.

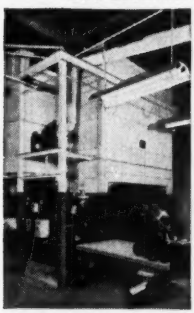


LANLY FINISHING OVEN Completely automatic LANLY A-Type Continuous Paint Baking Oven. Compact, built-in heating system affords rapid, uniform baking. Natural hot air seals at open ends. Space under oven can be utilized to advantage.

Two Continuous Laydown Dryers



Three-Pass Oven with Air Seal Vestibules

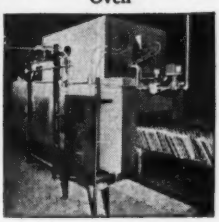


Vertical Hollow Ware Dryer

Ceiling Suspended Continuous A-Type Paint Oven

LANLY
FINISHING OVENS
THE LANLY COMPANY • 760 PROSPECT AVE
CLEVELAND, OHIO

Continuous Wicket Type Oven



Write for the NEW LANLY CATALOG

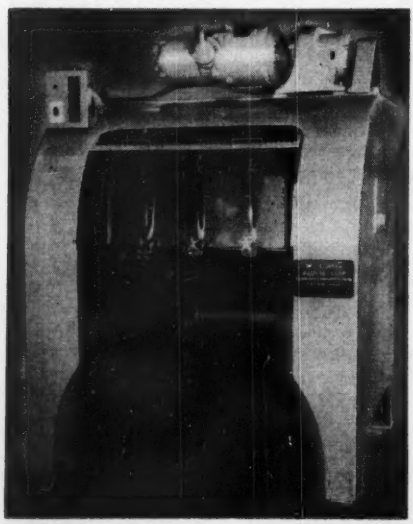
slag, on most items, is accomplished in one-tenth the time.

The compact unit is of welded steel construction with the exception of the barrel door which is made of aluminum for easy installation or removal. The insides of both barrel and barrel door have neoprene linings that not only greatly extend barrel life but assure quiet operation.

The large BurrMaster barrel is 32 inches in diameter and 48 inches long, having a total load capacity of 2000 pounds. Overall the unit is 72 inches high and 62 inches long.

For safe operation, all moving parts are completely enclosed. The perforated, exterior barrel guard is locked in the lowered position during operation.

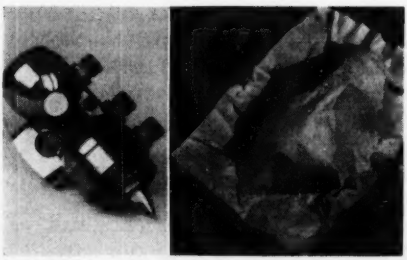
The new BurrMaster with variable speed drive can be set at any desired barrel r.p.m. from 5 to 30. Push button control makes it easy to position barrel door for convenient unloading and draining. The self-locking drive prevents the barrel from moving during loading or unloading. An electric timer leaves operator free during deburring cycle and automatically shuts off the equipment when the cycle is completed.



BurrMaster

Spot-Seal

Manufacturer: Sherman Paper Products Corp., 1630 Oak St., Newton Upper Falls 64, Massachusetts.



(Left) Metal product prior to wrapping. (Right) Same product wrapped in Spot-Seal.

Spot-Seal, a protective wrap for metal parts, makes a tight, dust-proof, water-repellent, tamper-proof wrap that keeps out dirt and foreign matter, and protects finely-finished metal surfaces from scratches, abrasion and fingerprints. Sticks only to itself. It can be used to wrap small sub-assemblies, and can't damage metal surfaces.

Iolyte Crocks

Schori Process Division of Ferro-Co. Corporation, Long Island City and Maspeth, Long Island, has announced the manufacture of crocks made of Iolyte, a Fiberglas* reinforced polyester laminate.

*Fiberglas is a trade mark (Reg. U. S. Pat. Off.) of Owens-Corning Fiberglas Corporation, Toledo, Ohio.

All chemists wear white coats!

Unlikely and unimportant but even if they look alike there's an important difference between them. KLEM chemists have dealt with almost every conceivable problem in their field. Their extensive experience enables them to more readily comprehend plant situations than ordinary chemists. The KLEM laboratory, equipped with the finest technological equipment for duplicating exact plant conditions and procedures, enables them to determine the correct answer to tough problems.

Let us help eliminate your bottlenecks, assist you as we have others in establishing profitable production schedules.

Representatives in most industrial areas.

3 OF 20 STANDARD KLEM PRODUCTS

KLEM STRIPPER No. 73—Heavy duty hot stripper for paint and enamels, rinses easily, eliminates hand scrubbing.

WATER WASH COMPOUND No. 203—Stops corrosion, keeps lines clean, prevents adhesion of paint to water curtain. Excellent for recovery.

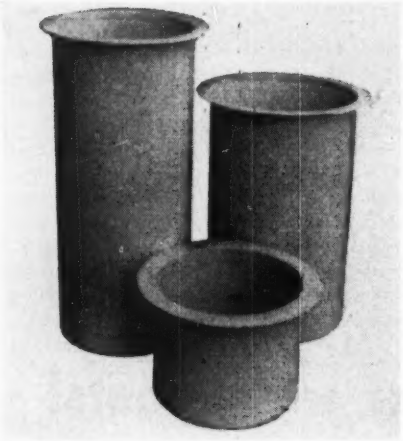
RUST-SOL No. 124—Concentrated phosphoric acid surface conditioner. Removes oil and rust. Provides slight etch to promote adhesion of paint. Meets USA 3-213, TAC-ES431 and MIL-C-10578.

KLEM PRODUCT of the MONTH

MINIT KOTE

Cleans, neutralizes, phosphatizes in 60 seconds. Frees metal surfaces from all traces of oil and dirt. Deposits light, uniform, phosphate coating for better adhesion of paint to ferrous metals and aluminum. Write for details.

KLEM Chemicals Inc.
14601 LAWSON . . DEARBORN, MICHIGAN



Iolyte Crocks

Iolyte is a chemically-resistant structural plastic that cannot break or crack. Although this plastic has the tensile strength of steel, pound for pound, it has only one-fifth its weight. No molds are needed so Iolyte crocks are cylindrical in shape, not tapered.

Iolyte crocks are available from stock in capacities ranging from 5 to 125 gallons; diameters from 9 to 28 inches; heights from 12 to 48 inches. Special sizes made to order.

For further information write Schori Process Division, Ferro-Co. Corporation, 8-07 43rd Road, Long Island City 1, N. Y.

Copper-Brite

Passivation of copper and most copper alloys can be obtained with a simple chemical dip and rinse process, available from Rossaul Company, 170 Fifth Ave., New York 10, N. Y.

Rossaul Copper-Brite removes atmospheric oxides in "seconds to minutes" and simultaneously passivates the metal so that it will resist oxidation —without surface coating—for periods ranging from three to six months, dependent on atmospheric conditions.

Rossaul Copper-Brite is safe to handle; special drains not required; it is non-toxic, non-fuming, requires no special ventilation, will not discolor silver solder and will not etch.

Manpro B-121 Vapor Degreaser

Recently introduced Manpro B-121 Vapor Degreaser provides quick, thorough vapor cleaning. Dirty parts or assemblies are clean, warm and dry in less than 50 seconds! Outstanding features are 2 vapor controlling condensers; large work clearance; 31 inches long, 20 inches wide, 16 inches deep; divided tank to provide boil sump and spray pump sump; pressure spray; and the Manpro Bar-L Unit which has 2 safety thermostats. Easily installed in 15 minutes, it requires only 220 volts single phase electrical outlet and stand-

Manpro B-121 Vapor Degreaser

Eliminate Hand-Wiping of Plated and Lacquered Parts

Designed to fit into existing plating lines, the Metalwash Spotless Dryer may be supplied with its own conveyor and drive. Available in any size, with or without cold, fresh water spray rinse.

Metalwash* manufactures a full line of cleaning machinery for plating, painting, lacquering, phosphatizing.

Write for free illustrated catalog.

*Reg. U.S. Pat. Off.

NEW: *Metalwash announces the first major change in Vapor Degreaser design in more than 20 years. Metalwash Improved-Design Degreaser includes these features:*

- **Obstruction-free tank walls**
- **Demand-type water control**
- **Removable pump chamber and water separator**
- **Simplified maintenance**

Write for illustrated catalog

METALWASH
MACHINERY CORPORATION
915 North Ave., Elizabeth 4, N. J.
Representatives in principal cities

first with the finest for washing, pickling, drying, degreasing

and water supply. Normal capacity is 500 pounds of steel per hour. Manufactured by Manufacturers Processing Co., 1360 Hilton Rd., Detroit 20, Mich.

PRODUCT LITERATURE

In requesting copies of catalogs or bulletins mentioned in this issue — use the READER SERVICE CARDS between the covers.

THE DETREX SONICLEAN PROCESS. The Detrex Corporation, Box 501, Detroit 32, Mich., producer of industrial metal cleaning equipment and chemicals, has announced the publication of a special technical folder on its new Soniclean Process, the application of ultrasonic energy for the cleaning of metal parts.

Illustrated by appropriate graphs and diagrams, the folder describes in considerable detail the principles and methods used in the new Detrex process. In the folder, the process is described as a "properly engineered combination of the solvent degreasing cycle and the application thereto of ultrasonic energy to produce the ultimate in precision metal cleaning."

The transmittal of sound energy through a solvent, results in "a direct impact upon the overall surface of a submerged piece of work, affording a cleaning action previously unobtainable except by hand wiping," the Detrex article says.

The company has carried its development work in the ultrasonic field to a point where it now can provide crossrod conveyorized or monorail Soniclean units that provide more than 120 work carriers per hour. These trays vary in size up to 10 x 10 inches and clean work up to 3 inches in height. Radio frequency generators up to 5 kw and larger are incorporated into the units, depending upon the sound intensity and the time cycle required to obtain the desired cleaning result.

The Soniclean process, the folder says, can be applied to nonabsorbent materials

MULTI-PURPOSE POLISHING MACHINE

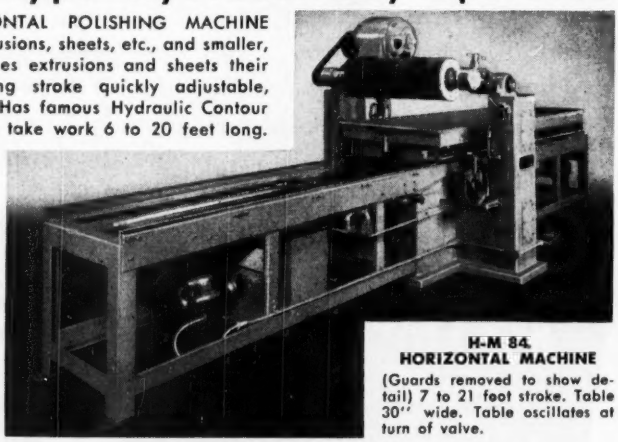
Horizontal Type—Hydraulically Operated

The CENTRAL HORIZONTAL POLISHING MACHINE handles long lengths, extrusions, sheets, etc., and smaller, odd-shaped pieces. Polishes extrusions and sheets their ENTIRE LENGTH. Polishing stroke quickly adjustable, 2 inches to full capacity. Has famous Hydraulic Contour Device. Standard sizes to take work 6 to 20 feet long.

- Polishes extrusions and sheets complete, end to end.
- Simple operation. Women run them.
- Adjustable stroke 2" to full capacity.

Machines, 7 to 21 foot stroke.

FULL INFORMATION ON REQUEST.



H-M 84. HORIZONTAL MACHINE
(Guards removed to show detail) 7 to 21 foot stroke. Table 30" wide. Table oscillates at turn of valve.

CENTRAL MACHINE WORKS

72 COMMERCIAL ST., WORCESTER, MASS., U.S.A.

GET AMAZING SAVING

WITH A *GASWAY*
CONTINUOUS METAL
CLEANING—TREATING—
ROLLACOATING LINE!

KoolVent of Indiana is one of the many companies making amazing savings using Gasway Continuous Metal Cleaning, Treating and Rollacoating lines. Two men operating this continuous system convert raw aluminum strip, from two inches to twelve inches wide, to finished recoiled stock at the rate of 42 lineal feet per minute. *Both sides are coated at the same time with different colors on each side.*

Saving on paint is another great economy. In this particular operation one gallon of paint covers about six hundred square feet of aluminum with a film .001 thick, the amount required for extreme durability. This coated stock is then roll formed after finishing, tremendously increasing the speed of finished part production.

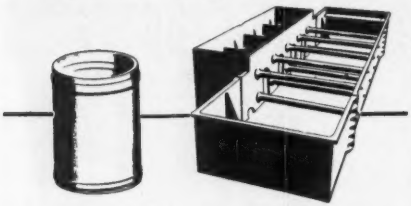
GASWAY CORPORATION

Write today for the KoolVent story—
"How to Save by Coating Before Forming"

6463 N. Ravenswood Ave., Chicago 26, Ill.

HAVEG PICKLING TANKS

LAST and LAST and LAST



- Molded into any size or type
- Superior corrosion-resistance

Haveg tanks can really take a beating . . . and beat corrosion at the same time. Haveg round or rectangular tanks effectively resist most acids, salts, chlorine and many solvents—even in boiling temperatures as high as 265° F., with a good margin of safety. Haveg is not a coating or lining, but a corrosion-resistant constructional material that can be molded into large, seamless tanks. Such tanks are extremely tough, durable . . . resist thermal shock, will not contaminate product-finishing. In every way, Haveg can be "custom-engineered" to fit your requirements: Tanks, pipe, valves, fume duct, heat exchangers, pumps, agitators.

Learn how Haveg can help you combat corrosion, improve production . . . call in a Haveg sales engineer, or write for 64-page Bulletin F-6.

HAVEG CORPORATION*
NEWARK 67, DELAWARE

FACTORY: Marshallton, Del.
Telephone: Wilmington 3-8884

ATLANTA Exchange 3821 | CHICAGO 11 Delaware 7-6088 | CINCINNATI 37 Valley 1610
CLEVELAND 20 Washington 1-8700 | DETROIT 35 Broadway 3-0880
HARTFORD 5 Hartford 6-4250 | HOUSTON 4 Jackson 6840 | LOS ANGELES 14 Mutual 1105
SEATTLE 7 Hemlock 1351 | ST. LOUIS 17 Hiland 1223

*A Subsidiary of Continental-Diamond Fibre Company.
SEND FOR 64-PAGE HAVEG BULLETIN F-6.

such as metals, glassware and molded products. "Even difficult soils such as buffing, lapping and honing compounds are readily removed. Iron oxide residues can be readily removed to a degree previously not obtainable. Many hand brushing or hand wiping operations are easily replaced by the Soniclean process which quickly removes soils from cavities, shallow indentations, small holes, interiors of hypodermic needles, and other precision finished surfaces."

ELECTRIC CIRCULATION HEATERS. Typical applications and operating characteristics of Chromolox electric circulation heaters are featured in 8-page **BULLETIN** 701 by Edwin L. Wiegand Company. The folder explains how the automatic circulation heaters give efficient, automatically controlled heating of water, steam, oil, heat transfer media, air and other gases for industrial processes.

Chromalox Circulation Heaters are packaged units complete with built-in elements, heating chamber, thermostat, insulation and mounting lugs. They arrive ready to attach to pipe lines leading to oil tanks, processing kettles, revolving rolls, water storage tanks and so on.

Photos and drawings show methods of installation and advantages of the packaged units for a wide variety of installations.

For a copy of **BULLETIN** 701 write to **Edwin L. Wiegand Co.**, 7552 Thomas Blvd., Pittsburgh 8, Pa.

PROPERTIES OF ELECTRODEPOSITED NICKEL . . . AND WHAT INFLUENCES THEM. BULLETIN A-153—extended abstract of a report of a 5 year investigation sponsored by the American Electroplaters' Society and carried out at the National Bureau of Standards, discusses, in a general way, uses; baths and types of deposits; and, specifically, properties of deposits and the variables that influence them; composition and structure of deposits. The results of this study are of interest to users and producers of nickel plating for (a) electroformed shapes, (b) building up worn or over machined components and (c) heavy industrial coatings that impart nickel's corrosion resistance to common materials of construction. **International Nickel Company, New York 5, N. Y.**

A FEW OF THE MANY FORMAX PRODUCTS

STYLE C-20 CONTACT WHEELS

and F-26 Belt Lubricant

A C-20 flexible Contact Wheel will form itself to the shape of the work and permit the abrasive felt to polish contoured surfaces and F-26 Abrasive Belt Lubricant will increase belt life by preventing loading and glazing. Produces finer, smoother and brighter surfaces through lubrication.

ZIPPO BUFFS

These famous long-wearing buffs run cool under all buffing conditions. Constructed of high count bias-cut cloth or sisal mounted on safe steel centers. Available in a wide range of densities and center diameters.

A complete line of buffing compounds in bar form as well as in liquid form for brush or spray application. Also Flex-A-Glu polishing wheel cements.

Our Laboratory and Sales Engineering staff would welcome the opportunity to be of help in solving your finishing problems.

Send for descriptive literature

FORMAX MFG. CORP.

DETROIT 7, MICHIGAN

"THE FOUR McALEERS"

MANUFACTURED IN CANADA BY JOHN GALLOWAY LTD., KITCHENER, ONT.

SURFACE FINISHING JIGS. A catalog sheet showing several designs of fixtures, jigs, and work racks developed for use with Clair Surface Finishing Machines is available from **Clair Manufacturing Co., Inc.**, Olean, N. Y. Designs of five jigs, each one of which is adaptable to several production parts, are shown on the catalog sheet.

SEL-REX BRIGHT GOLD PROCESS. A leaflet discussing the materials, equipment, and general operating conditions necessary to the use of the Sel-Rex Bright Gold Process is available from **Sel-Rex Precious Metals, Inc.**, 229 Main St., Belleville 9, New Jersey. In addition, the service facilities of the company are listed and one section of the leaflet is devoted to an illustration of one of several models of the Sel-Rex Selenium Rectifier for gold electroplating, outlining features of the rectifier and styles available.

NYB BULLETIN 530. A specification sheet showing charts indicating c.f.m. at various outlet velocities, designation of direction of rotation and discharge, condensed capacity tables, and motor data, for the No. 76 and No. 91 models Belted Junior Fans, is available from the manufacturer, **The New York Blower Company**, 3167 S. Shields Ave., Chicago 16, Illinois. Both models are illustrated, including diagramatic sketches. One page describing other products of the New York Blower Company, is included.

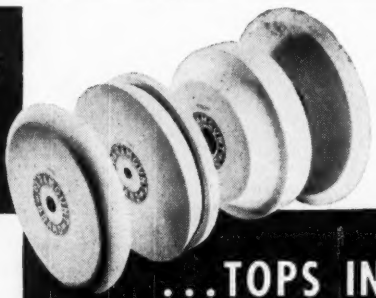
METAL SURFACE PREPARATION CATALOG. Klem Chemicals, Inc., 14401 Lanson Avenue, Dearborn, Michigan, has announced a new catalog for use by metal processors and finishers to aid in selecting correct chemicals for various operations. The catalog lists 33 standard Klem products and contains a comprehensive application chart for surface preparation of ferrous and non-ferrous metals.

Klem's laboratory facilities for compounding special chemicals for unusual conditions are described in the catalog.

T. Curtis McKenzie, president of Klem Chemicals, Inc., announced the new catalog at the company's National Service Engineering Clinic attended by all field service engineers, held the week of August 24th at Dearborn Inn, Dearborn, Michigan. Copies may be obtained by addressing the company.

PARAMOUNT BRAND

FELT WHEELS



...TOPS IN "Contourability"

Are you finishing articles which require a wheel with a "shaped" or contoured face? Don't forget that felt wheels lend themselves to contouring probably better than any other type of wheel. Don't forget, too, you have nine degrees of hardness to choose from when you buy Bacon Felt Wheels—The Paramount Brand. Ask your supply house for Paramount Brand Felt Polish Wheels.

Send for Our New Catalog

BACON FELT COMPANY

Established 1825

TAUNTON "America's Oldest Felt Manufacturer"

MASSACHUSETTS "Felt Does It Better"

Your Supply House can Furnish Bacon PARAMOUNT BRAND FELT BOBS & WHEELS

Another example of Bede leadership

BEDE AIRLESS PAINT SPRAYING SYSTEM

This advertisement announces the first of three major new developments for the paint industry.

The most important development in the history of paint application

Now... obtain better coverage with less time, labor, and material, even over surface irregularities and foreign matter

Now... reduce paint loss due to overspray, and dispense with elaborate booths

Now... eliminate paint rebound into sprayer's face

Here is a revolutionary approach to industrial finishing, so far ahead in its field, so moderately priced, so easy to use, it is destined to swiftly outmode other paint application methods.

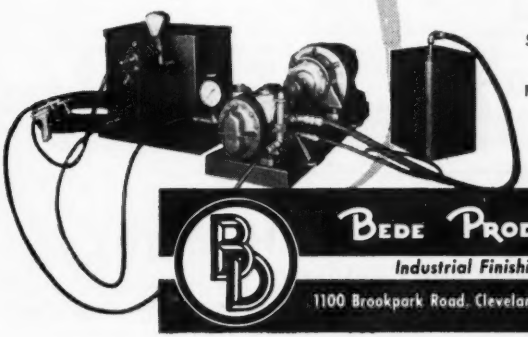
A new principle, harnessing *heat* and *hydraulic pressure*, results in *complete* atomization. No compressed air is used. With specially designed, patented equipment, paint is siphoned from container into the system by electrically driven hydraulic pump, sent through a heater, to a new, light-weight spray gun, where volume and angle is controlled by selection of nozzle.

Patent Pending

EASY TO INSTALL

SAVE MONEY!.. INCREASE YOUR PRODUCTIVE OUTPUT!

For informative literature, contact your local Bede distributor, or



BEDE PRODUCTS *Inc.*

Industrial Finishing Equipment

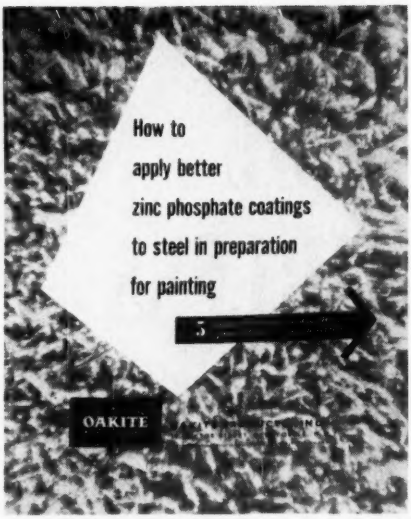
1100 Brookpark Road, Cleveland 9, Ohio • Telephone ONtario 1-9400

BLACK MAGIC "PIK-AIDE" DATA SHEET. A data sheet on "Pik-Aide," a chemical solution which is added to hydrochloric (muriatic), sulfuric and nitric acid pickles to produce a brighter, uniform, faster and more economical pickling action, is available from the **Mitchell-Bradford Chemical Co.,** 2446D Main St., Stratford, Conn. Six advantages of the product are listed.

BRAKE DISKS DEBURRED ON SPECIAL FIXTURES IN ROTATING BARRELS. A 4-page reprinted article describing the deburring of steel brake disks in Roto-Finish barrels is being distributed by the **Roto-Finish Co.,** 3704 Milham Rd., Kalamazoo, Michigan. The complete process, including necessary fixtures and processing materials, is described in the article.

PHOSPHATE COATING BOOKLET. **Oakite Products, Inc.,** manufacturer of industrial cleaning and allied materials, has announced the publication of a new booklet **"HOW TO APPLY BETTER ZINC PHOSPHATE COATINGS TO STEEL IN PREPARATION FOR PAINTING,"** which describes the recently developed Oakite CrysCoat HC Process.

This 12-page booklet presents a concise, clear-cut explanation of the problems involved in securing lasting paint adhesion



on steel, and in protecting painted surfaces from electrochemical corrosion. It describes the action of Oakite CrysCoat HC in coating steel surfaces with a heavy zinc phosphate film which exceeds the requirements of U. S. Government Specifications JAN-C-490, Grade I; 57-0-2C, Type 2, Class C; and PA-PD-191 (Rev. 1). Photographs showing the results of standard salt spray tests on treated and untreated steel panels, and drawings illustrating both corrosion and the anti-corrosive action of Oakite CrysCoat HC are among the many illustrations.

The booklet also emphasizes the simplicity of the Oakite CrysCoat HC Process, pointing out that only one material is needed for makeup and upkeep; only one simple type of titration is required; relatively little sludge and scale are produced; and stainless steel is not required throughout the equipment.

Copies of the new booklet are available without charge to readers writing on company letterhead to Oakite Products, Inc., 120 Rector St., New York 6, N. Y.

MASKING TAPE
DIE-CUT TO YOUR EXACT SPECIFICATIONS FROM
SCOTCH BRAND
INDIVIDUAL PIECES • ANY SIZE OR SHAPE
For quick, accurate masking operations.
PHONE OR WRITE **PANOCO**
505 Carroll St., Brooklyn 15, N. Y.

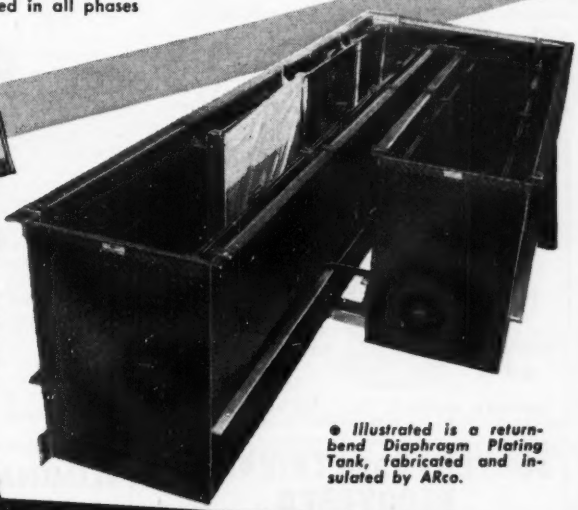
For a real good polishing job use
Keystone TURKISH Emery
FRESH SUPPLY AVAILABLE
KEYSTONE EMERY MILLS *Write for Sample* 4316 Paul St., Phila., Pa.

Reduce Rejects Improve Quality

with DIAPHRAGM PLATING and ARco RUBBER LINED TANKS

● Providing for separate anode and cathode compartments, Diaphragm Plating Tanks, engineered by ARco . . . eliminate costly buffing due to roughness . . . prevent rejects due to thin spots . . . produce uniformly high plating quality.

Thoroughly experienced in all phases of electroplating, ARco engineers have an outstanding record of successful Diaphragm installations and conversions. They can help you achieve greater efficiency and higher quality production in your operations.



SEND FOR THIS VALUABLE INFORMATION NOW . . . See the many ways in which you can reduce operational costs and improve electroplating production in quality and quantity.

● *Illustrated is a return-bend Diaphragm Plating Tank, fabricated and insulated by ARco.*

ARco

ANYTHING CAN BE COVERED WITH RUBBER — BY ARco

LICENSED SARAN APPLICATORS

AUTOMOTIVE RUBBER CO., INC.
12564 BEECH ROAD AT P.M. R.R. DETROIT 28, MICHIGAN

●

ARCO RUBBER PROCESSORS
4033 HOMESTEAD ROAD • HOUSTON, TEXAS

MANUFACTURERS • DESIGNERS • ENGINEERS

FOLDER ON RODINE PICKLING ACID INHIBITOR. An illustrated folder describing Rodine pickling acid inhibitors is available from **American Chemical Paint Co.,** Ambler, Pennsylvania. The folder describes the advantages of using Rodine pickling inhibitors in connection with acid pickling of steel, and includes charts and graphs showing actual savings in acid and metal. Types of Rodine inhibitors are mentioned. Selection charts are included in which the various types of Rodine are specified for various pickling conditions, both in sulfuric or muriatic acid pickling.

DUST AND FUME ELIMINATORS. Two new Centri-Merge Vertical Rotor wet type dust and fume eliminators are described in **BULLETIN VU-8-53,** issued by **Schmieg Industries, Inc.,** P. O. Box 4701, Detroit 34, Michigan.

One Vertical Rotor unit is for wet collection and elimination only, while the other is a combination primary dry and secondary wet collection and elimination unit.

The combination unit has an integral dry type pre-cleaner for dry collection of heavier and most fine particles. It is particularly useful where material salvage

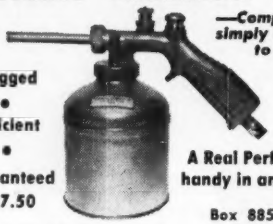
is an operational requirement.

Both the new Centri-Merge units combine the cyclonic principle of dust separation and positive high pressure water action, to wash impurities from the air in a rotating torrent of water. For certain applications, according to Schmieg, other liquids may be substituted for water. Capacities range from 500 to 50,000 C.F.M.

Schmieg also engineers and manufactures production finishing equipment, spray booths, industrial ovens, mechanical washers, and sheet metal equipment and accessories.

PLATING ANODES CATALOG. An eight-page, illustrated catalog published by **Federated Metals Division, American**

Portable Sandblast Gun



—Complete— simply connect to air line

Rugged • Efficient • Guaranteed $27.50

A Real Performer handy in any shop

LINDBERG PRODUCTS CO., Box 885 P Los Gatos, Calif.

SOLVENTS and THINNERS RECOVERED

from wash thinners, spoiled lacquers, degreasing machine sludge, etc.

Solvents recovered by the Lofgren Process. Each customer's shipment, whether one drum or a carload, receives proper and separate treatment. *Write to:*

Solvents Recovery Service, Inc.
1025 Broad St. Newark 2, New Jersey

Hammond Solvents Recovery Service
241 Brunswick Rd. Hammond, Ind.

ELIMINATE ZINC PLATING HEADACHES

by purifying your solution with

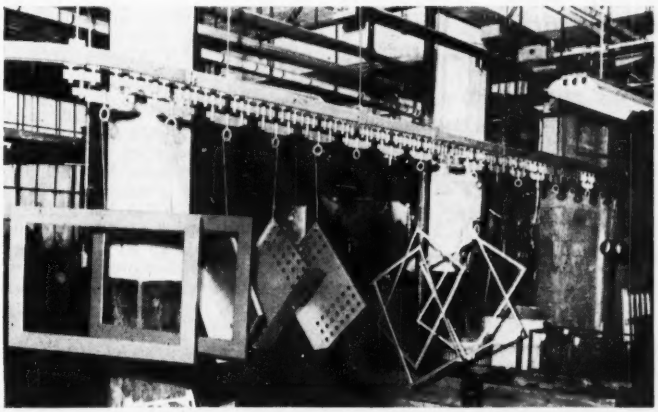
McKeon's Zinc-Brite

Write for complete information.

Sulphur Products Co., Inc.
228 McKEON WAY GREENSBURG 6, PA.

R-W No. 2035 SAFE-RAIL TRACK SYSTEMS

• Modern • Streamlined • 1000 lb. Cap.



Spray finished parts in the Ohio Chemical Plant, Madison, Wis., after final baking and inspection, are shown still suspended on SAFE-RAIL track while awaiting transportation to the assembly areas.

SAFETY—The structural profile of this track earns it the name SAFE-RAIL, as all personnel are protected from accidental contact with the load bearing wheels of the carriers.

CLEANLINESS—Enclosed track provides maximum protection of wheel bearings against accumulation of dust and dirt, thus reducing maintenance to a minimum.

For further details, write to

RICHARDS-WILCOX MANUFACTURING CO.
MATERIALS HANDLING DIVISION

276 Third Street **Aurora, Illinois**

There's still a
NICKEL SHORTAGE!
— BUT

Now you can have bright, attractive, wear-resistant chromium plated finishes *WITHOUT THE USE OF NICKEL*

LUSTER-ON® ZINCROME® PROCESS*
provides *excellent corrosion resistance* — up to 50 hours standard salt spray

LUSTER-ON ZINCROME PROCESS
provides *good wear resistance* — the hardness of chrome plate needed for tools, bumpers, etc.

LUSTER-ON ZINCROME PROCESS
provides *accepted brilliant finish* — for outside wear exposure required for automotive trim, etc.

LUSTER-ON ZINCROME PROCESS
provides *economical operation* — high, rugged quality at lowest possible operating cost

LUSTER-ON ZINCROME PROCESS
provides a *precisely controlled "package" process*—10 easy-to-follow, easy-to-use steps

Specify

LUSTER-ON • ZINCROME • PROCESS

FOR CHROMIUM PLATED FINISHES WITHOUT THE USE OF NICKEL

Write for free data sheets and send a part for free processing

*Patent Applied for

THE *Chemical* CORPORATION
75 Waltham Ave., Springfield 9, Mass.

Smelting and Refining Company, provides full information on copper, lead, zinc, tin, tin-lead, cadmium, cadmium oxide and brass plating anodes.

Data on sizes, shapes, compositions and other characteristics are included in the catalog to make easy the ordering of the proper anode for any kind of job. Prominent among the many anode types described is the exclusive Conducta-Core lead anode for heavy-duty decorative or hard chromium plating.

Copies of the catalog, **BULLETIN No. 141,** are free on request. Write to Federated Metals Division, American Smelting and Refining Company, 120 Broadway, New York 5, N. Y.

BONDERITE 710 FOR ALUMINUM. A technical publication available from **Parker Rust Proof Co.,** 2172 Milwaukee Ave., E., Detroit 11, Mich., discusses treatment of aluminum and its alloys with Bonderite 710, an amorphous chromate coating. The folder illustrates the results of salt spray and elongation tests and gives directions for application of the product by spray, immersion, and brush.

ABRASIVE BELTS SPEED PRODUCTION CONTOUR POLISHING AND GRINDING. A reprint of a three part article by Dirck Olton, Product Engineering Dept., Behr-Manning Corp., is available from **Behr-Manning Corporation,** division of Norton Co., Troy, New York. Liberally illustrated, Part I describes production applications of off-hand abrasive-belt contour grinding. Part II continues a description of off-hand abrasive belt contour grinding and discusses recent developments in various off-hand setups. In conclusion, Part III discusses semi-automatic and completely automatic polishing and grinding setups.

FILTRATION BULLETIN. A general 8-page bulletin is available on **DELPARK INDUSTRIAL FILTERS.** Major features and complete dimensions and capacities of the various Delpark Filters available for industrial applications are given. Delpark Filters feature continuous, full-flow, self-cleaning, fully automatic disposable belt-type filtration. Applications include filtration of quenching oils, coolants, paint spray booth water. Copies of the bulletin may be obtained by writing to George L. Guymon, vice president, **Industrial Filtration Company,** Dept. 312, Lebanon, Indiana.

Siliconized WITCH OIL

The Rust Preventative Supreme

Features of

Siliconized WITCH OIL

- **Imparts Higher Resistance to Oxidation**
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- **Water Repellent**
- **Polarized**
- **Superior Corrosion Resistance**
- **Enhances Appearance of Work**

Here is a rust preventative that really gives extra protection and better lubricating qualities to your parts. Perhaps you are already familiar with the advantages of silicones and therefore know the value of a silicone surface - - in short this means water repellency at its best.

When applied over a black oxide, phosphate or other type of finish you will be assured of a greater corrosion resistance at a much lower cost per hour of protection. Siliconized Witch Oil is ideal for protecting work in process or your finished parts in storage.

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2446D Main St. Stratford, Conn

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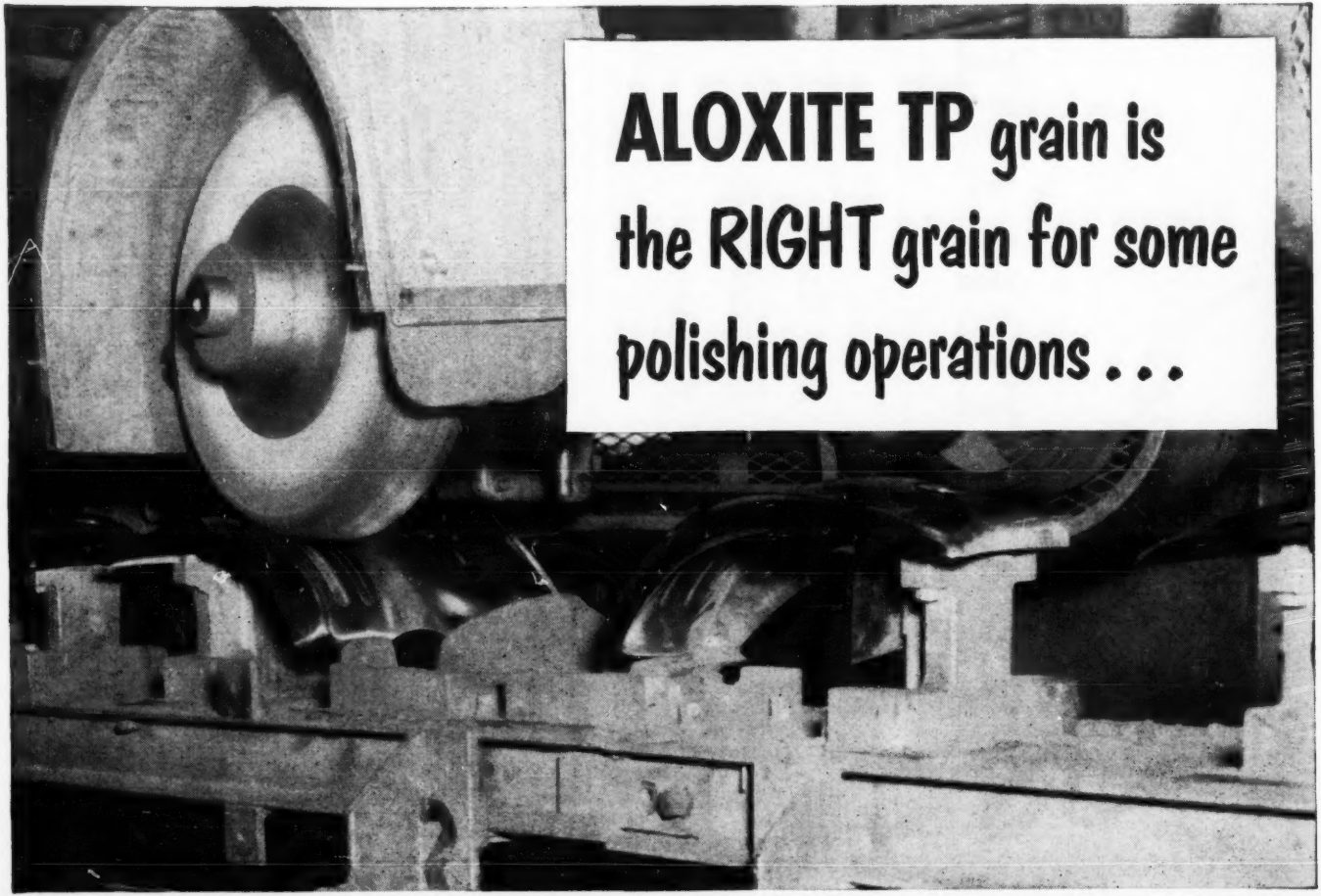
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the RIGHT grain for some
polishing operations . . .

. . . and the right one for EVERY operation is among the other six in the complete line by CARBORUNDUM

ALOXITE TP grain is just one of the outstanding grain types in the most complete line available to industry. It's a tough, blocky aluminum oxide grain—ideal for polishing operations involving heavy stock removal on steel and other high-tensile-strength metals. If that's your problem, ALOXITE TP grain is *right* for you!

GRAIN TYPE	CHARACTERISTICS	PRIMARY USES
ALOXITE TPT Aluminum Oxide	Tough, sharp. Grits 16 through 100.	Polishing operations involving removal of large amounts of metal.
ALOXITE TPL Aluminum Oxide	Very sharp, friable. Grits 16 through 220.	Polishing low tensile strength metals—copper, brass, bronze, aluminum.
ALOXITE TPC Aluminum Oxide	Medium sharp. Grits 16 through 220.	General purpose polishing grain—for removal of small amounts of metal.
ALOXITE TPW Aluminum Oxide	Powder. Grits 240 through 1000.	As the abrasive in paste heading of polishing wheels and belts.
CARBORUNDUM RA Silicon Carbide	Sharp, very friable. Grits 10 through 240.	Polishing cast iron.
CARBORUNDUM RA Silicon Carbide	Powder. Grits 280 through 600.	General purpose polishing.

FOR FREE BOOKLET, "Abrasive Grain and Powders," write Dept. P 83-52R.

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83-52P

Practical Applications of modern products

Electro-Spray Finishing of Window Hardware

WHEN Standard-Thompson Corporation, Dayton, Ohio, revamped its window hardware finishing and assembly plant, the Ransburg No. 2 Electro-Spray Process was installed.

Gene Hetrick, production coordinator, reported that automatic electrostatic spray has solved one of assembly's major bottlenecks. Daily production has doubled, even though the line is not yet operated at full capacity.

Production formerly ran around 400 to 500 pieces per hour. Now, with the new Ransburg unit, one thousand pieces per hour are being processed. Maximum capacity, according to Mr. Hetrick, is nearly two thousand per hour.

In addition to increased production, the high efficiency of the No. 2 Process is producing 1500 good pieces per gallon of mixed paint. Quality of the work is greatly improved, and rejects due to bad painting have been eliminated.

Seven different parts make up Standard-Thompson's window hardware unit —the type used on Jalousie windows. Two of the parts, the casing—which holds most of the operating parts—and the crank, are finished with either aluminum or bronze lacquer.

Under the present arrangement, two loaders place the parts to be painted on special, multiple-type workholders (see Fig. 1). Sixteen handles, or cranks, are carried on one holder (see Fig. 2); and eight of the cases are hung on holders of another design. Both cases and handles are painted at the same time, with the same setting of the electro-spray equipment. Workholders are spaced on twelve-inch centers on the overhead chain conveyor, which moves at 18 inches per minute.

The Ransburg unit at Standard-Thompson employs the new disc-type atomizer, instead of the familiar bell-shaped head. As in all other No. 2 Process installations, no compressed air is used. The lacquer, in this case, is metered at a constant rate, by a positive-

Fig. 1—This is the loading, unloading and inspection station on the assembly and finishing line at Standard-Thompson Corporation.

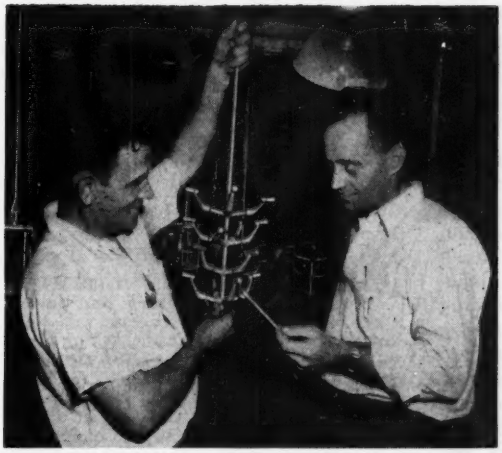


Fig. 2—John Mustard (left), is supervisor of the assembly and finishing department, and Gene Hetrick (right), is production coordinator in charge of the operation. Mr. Mustard is holding one of the special fixtures that holds 16 handles.

displacement type pump unit, to the center of the rotating disc. A source of electrostatic high potential, having one terminal connected to the disc, creates a strong electrostatic field between the disc and the articles to be painted, which are grounded by the conveyor. This field produces a fine spray of charged paint particles which are attracted to the parts "like iron filings to a magnet."

The conveyor track makes a circular loop in the painting area, and the disc atomizer is positioned in the center of the circle (see Fig. 3). Workholders are revolved slowly as the parts travel around the electro-spraying disc.

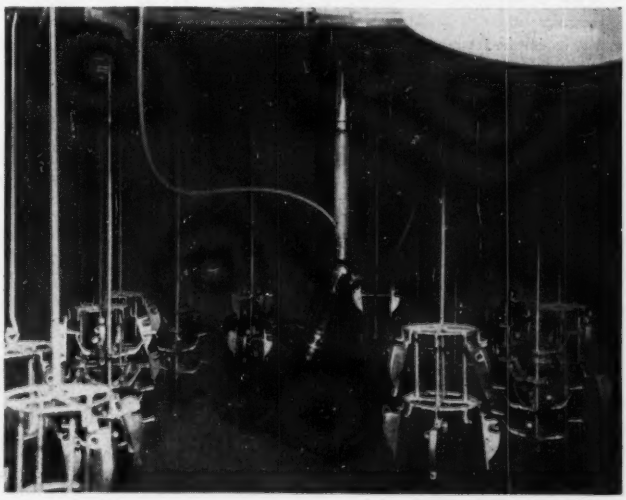


Fig. 3—The new Ransburg No. 2 Process disc-type atomizer paints small, irregularly shaped, window hardware parts. Workholders revolve as they circle around the electro-spray unit.

No spray booth is needed since there is no overspray paint to be exhausted; however, there is a semi-circular steel shield placed around the painting area, with an exhaust for removal of escaping solvent vapors.

After the work leaves the painting area, it passes through a bank of infra-red lamps (see Fig. 4). A temperature of 120 deg. F. for approximately three minutes gives a satisfactory force-dry.

The finished, painted parts are then unloaded, inspected and placed on a conveyor belt that carries them down an assembly line. When the casing comes down the line, a metal worm, and a spring and bushing are put into it and locked in place by a press. An arm is inserted, and a shaft forced in to anchor it. As a final step, the handle or crank is put on, and the unit is tested for proper operation. Then, the finished unit is wrapped, packed, and sent to the shipping department.

The revamped finishing and assembly lines are a good example of how sound engineering practices, research and development, new tools and processes, and production teamwork have been combined to lick a tough problem.

In the words of John Ericksson, works manager, "We have better tools now, better coordination of production and scheduling; and it is paying off. Both our quantity and quality are up, and our costs are down."

PACKAGE WATER CONDITIONER. Permutit's Package Water Conditioning Plant, an extremely versatile and self-contained unit, designed to chlorinate, coagulate, clarify, filter, neutralize, dealkalize and soften raw water supplies is graphically described and illustrated in **BULLETIN No. 3869.** This bulletin should be of special interest to all executives and engineers with water problems.

Prepared by **The Permutit Company,** 330 W. 42nd St., New York 36, N. Y., it lists the component parts of the complete water conditioner, details the principles of operation, gives ratings, capacities and sizes and illustrates some typical installations. These modern plants have many applications in the finishing industry as well as other industries and municipalities.

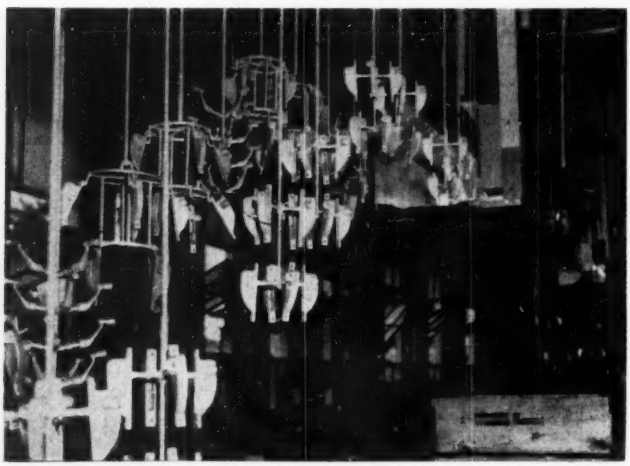
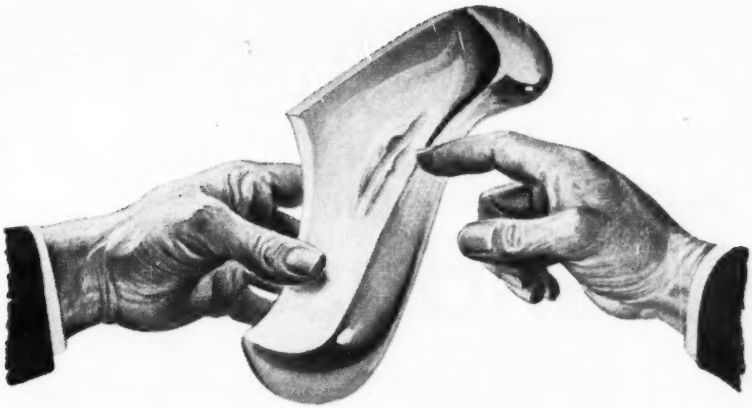


Fig. 4 — Painted parts are force dried in a 3-minute infra-red bank at 120 deg. F. *(Photos courtesy Ransburg Electro-Coating Corp., Indianapolis, Ind.)*



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Impurities in the plating bath can cause poor adhesion . . . stripping of plated coatings . . . loss of expensive and scarce anode metals. But—you can make sure that solutions are free from impurities, by using Red Label Darco S-51.

Start CLEAN . . . *Stay* CLEAN

Red Label Darco S-51 is highly activated, to assure complete adsorption of unwanted materials. A special manufacturing process removes the last traces of sulfides which can cause dull plating, poor adhesion and brittleness. Red Label Darco S-51 is easy to handle in the shop. It wets readily, and mixes quickly into slurries.

Order your stock from your local supplier today. And be sure to specify Red Label Darco S-51—the activated carbon especially made for cleaning plating solutions.

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NEWS of the Industry

NEW PLANTS

The **BAY STATE SPRAY EQUIPMENT COMPANY**, Massachusetts distributor for the **BINKS MANUFACTURING COMPANY** of Chicago, has recently moved to enlarged sales and service offices in the following locations: 438 Dickenson Ave., Springfield 8, Mass. (headquarters office); 4339 Washington Street, Boston 31, Mass.

The new offices have warehouse facilities for the various items in Binks complete line of spray painting equipment. Each operates a repair department. And the factory-trained staff at each office is well qualified to answer questions pertaining to spray painting and coating of equipment and materials.

According to James Lynch, owner of Bay State Spray Equipment Co., these new offices are another step in a campaign to insure adequate stocks, improved service and prompt deliveries of Binks equipment through all sections of the New England region and the adjoining New York region including Albany and Schenectady. This area is one of the country's most important trading and industrial sections.

THE AUTOMOTIVE RUBBER CO., INC., manufacturer of rubber lined plating tanks, rubber insulated plating racks, baskets and trays, rubber lined tanks and accessory equipment for diaphragm plating installations, has moved into a new plant and general office at 12564 Beech Road, Detroit 28, Michigan.

(Left) New headquarters of the Bay State Spray Equipment Co., recently opened at 438 Dickenson Ave., Springfield 8, Mass. This concern is the Massachusetts distributor for Binks complete line of spray painting equipment. (Right) New offices recently opened at 4339 Washington Street, Boston 31, Mass., by the Bay State Spray Equipment Co.

Yes, these HONITE distributors are experts—men who offer you *advanced techniques* in every phase of barrel finishing.

Your HONITE distributor will process your samples—determine the exact size HONITE chip and kind of HONITE compound best suited for your needs. He will demonstrate the latest equipment to you. He can do job tumbling for you—by the carton or by the carload. Too, he can train *your* personnel in the best methods of handling barrel finishing equipment and supplies . . . and he has a large warehouse stock of HONITE chips and compound, ready for immediate delivery to you.

So call your HONITE distributor today. He'll show you that low-priced HONITE is the longest-lasting, fastest-cutting natural barrel finishing abrasive on the market. You'll see that no other barrel finishing abrasive—not even granite—retains its cutting edges as long as HONITE!

Authorized HONITE Distributors · Sales and Service

Micro Deburring Co. Chicago, Ill.	**Metal Finish, Inc.** Newark, N. J.	**Gerrell Mfg. Co.** Cleveland, Ohio
Mechanical Finishing Co. Cincinnati, Ohio	**M. E. Baker Co.** Cambridge, Mass.	**Mosher Co.** Chicopee, Mass.
Metals Finishing Corp. Hazel Park, Mich.	**Tumbling Products, Inc.** Indianapolis, Ind.	**Precision Tumbling & Supplies Co.** Stratford, Conn.
Metal Parts Processing Co. Newark, N. J.	**Deburrco, Inc.** Philadelphia, Pa.	**Sundmark Supply Co.** Los Angeles, Calif.

Minnesota Mining & Mfg. Co., Dept. PF-103, St. Paul 6, Minn.

Yes, I am interested in HONITE Service

☐ Send me free copy of booklet "3M Barrel Finishing"

☐ I'd like to have a HONITE Sales Engineer call on me

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Company.....

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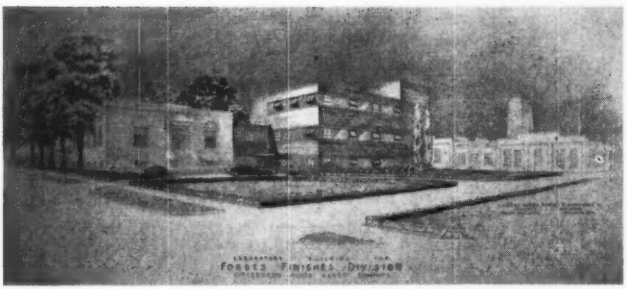
City.....Zone...State.....

Made in U.S.A. by Minnesota Mining & Mfg. Co., St. Paul 6, Minn.—also makers of "Scotch" Brand Pressure-Sensitive Tapes, "Scotch" Sound Recording Tape, "Underseal" Rubberized Coating, "Scotchlite" Reflective Sheeting, "Safety-Walk" Non-slip Surfacing, "3M" Abrasives, "3M" Adhesives. General Export: 122 E. 42nd St., New York 17, N. Y. In Canada: London, Ont., Can.



Architect's conception of new laboratory building for Forbes Finishes Div., Pittsburgh Plate Glass Co.

Construction is underway on a new laboratory building for the **FORBES FINISHES DIVISION** of **PITTSBURGH PLATE GLASS COMPANY,** according to an announcement by E. D. Peck, vice president. The Cleveland operation is essentially an automotive and industrial finish producer.

The new building will be a three-story structure adjoining the division's administration office building, 3800 West 143rd Street. The laboratory will contain 12,000 square feet and the building is so designed that the floor area can be doubled for future expansion.

Planned essentially as a lacquer development laboratory, it will be completely air conditioned to provide the humidity control necessary to lacquer development work. The existing laboratory will continue to function as a Synthetic Resin Enamel Unit.

Space and equipment for a library conference room and a larger general meeting room will be included in the new building.

COMPANIES

Both the **METAL FINISHING DIVISION** and the **FOUNDRY FACING AND EQUIPMENT DIVISION** of **FREDERIC B. STEVENS, INC.,** will feature new engineering developments at the 1953 National Metal Exposition.

The latest engineering achievement in tumble finishing and deburring will be featured at the Stevens exhibit, booths 2547-55. This new Roto-Finish Dual Action (Model DW 48-42-IDA) Machine was designed for the job of deburring compressor-rotor wheels for jet engines. This equipment is capable of cutting working time required on such deburring jobs by more than 90 per cent.

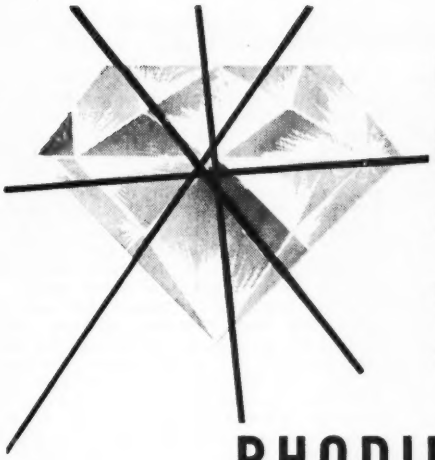
A complete Stevens Waste Disposal System employing Dorrco d-i cells will be installed as part of the Stevens exhibit. This practical method of solving this waste disposal problem through the use of ion-exchange will save individual industries countless thousands of dollars in reclaimed chemicals and community good will.

The Automatic Barrel Plating and Processing Equipment display, which in 1952 was the largest single piece of equipment displayed on the floor of the show, will be exhibited. This unit is cutting costs for hundreds of companies through automatic processing of small parts. Adaptable to over 25 different types of metal processing, from zinc plating to anodizing and phosphate coating, this machine will be in actual operation for the show visitors.

NORTON COMPANY, Worcester, Mass., will exhibit both abrasive and refractory products in its display booth No. 1933 at the National Metal Exposition to be held in Cleveland, October 19 to 23.

To be introduced publicly for the first time at this show will be Norton Crystolon Heating Elements. These elements, now being introduced commercially, have been used successfully for several years in Norton's new plant for the production of precision grinding wheels. These electrically fired tunnel kilns require a minimum of maintenance and element life is up to 18 months. Complete technical information on these elements will be available at the show.

Cut-off wheels will also be featured. Prominent among these will be the new Norton B9 and R50 wheels which will be demonstrated on a Stone cut-off machine. The B9 is an improved resinoid bonded cut-off wheel which has been making possible savings of up to 85 per cent in the cost of cutting-off operations. The R50 is an improved rubber bonded wheel which has been designed to give a high quality cut with no burr, burn or case hardening of the ends of the work. This wheel is designed for cutting solid stock.



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The hard, brilliant white finish of rhodium is now widely used in the jewelry industry to give enduring reflectivity to settings — thus enhancing the natural brilliance of the set stones. Rhodium *does not* lose its initial high reflectivity upon exposure to atmosphere but retains it indefinitely . . . For gem settings and other decorative and commercial applications Baker Rhodium Plating Solution allows fast, easy application of a bright, corrosion-resistant finish . . . Write for booklet #15, "Directions for Rhodium Plating", for complete details.

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A companion wheel, the R20, (also to be shown) has been developed especially for cutting tubing and hollow stock.

To demonstrate the use of tumbling abrasive for barrel finishing, Norton will display a transparent plastic tumbling barrel which will show the action within the barrel when parts are finished by this method. An actual Bench Type finishing barrel will also be on display and rough parts will be finished.

Norton personnel in attendance at the show will be: Irving W. Stanton, C. Leonard Shaw, Russel A. Reed, Enfried T. Larson, Bert G. Ebbeson, Richard H. Merritt, William J. Mahan, Malcolm M. Maynes, Warren H. Davenport, James L. Miller, Frank A. Singer, Joseph F. Hartl, Charles Bonn, Ercell R. Stevens, David B. Tyler, Robert H. Cannon, Carl Soderlund, Oscar A. Nierendorf, Warren L. Hardy, Bruno D. Hendrickson, Evan C. Luce, James A. Coleman, Ernest L. Gustafson, Elliot D. Linton. Norton Cleveland office personnel who will be in and out of the show during the week are: Fred P. Hays, William D. Bennett, George W. Nelson, Thomas L. Baker, Sherwood F. Prescott, Cheever H. Ely, Robert V. Bergstrom, Walter E. Foreman, DeRoss Salisbury, Harlan W. Cobb, Alfred C. Womer, Edmund H. Gagnon.

Metal processing along several allied lines will be demonstrated in Booth 1019 at the National Metal Show by **E. F. HOUGHTON & CO.**, Philadelphia.

Room temperature cleaning of metal parts will be demonstrated in a power washer using Houghto-Clean Nos. 439-440, detergent-wetting agent combination which requires no extra heat, thereby saving on fuel and leaving parts cool enough to handle as they come out of the washer, with no immediate rusting danger.

A new surface conditioning process for metals whereby a zinc phosphate coating (Houghto-Phos) is deposited uniformly on the metal to conform to standard specifications, will be introduced by Houghton at the Show.

Houghton heat treating salts and fast quenching oils will also be featured in the exhibit. A model of a cold strip mill in operation will serve to point out the products supplied by Houghton for steel mill applications, including pickling inhibitors, ingot insulating material, cutting fluids, rust preventives and specialized lubricants.

New power brushing methods for removing burrs and blending surface junctures and other finishing jobs of large or heavy work pieces have been developed by the **OSBORN MANUFACTURING COMPANY**, Cleveland, Ohio, and will be shown to the metal working industry for the first time at The National Metals Exposition, Cleveland, October 19-23.

Two new brushing developments, model Nos. 4 and 5 brushing machines will be demonstrated at their booth.

Using these new Osborn methods for deburring and blending surface junctures, one jet engine manufacturer realized 10 times the work output. Finishing a 37½ inch diameter speed reducer gear by hand required 32 minutes. On the Osborn No. 5 brushing machine the job was completed in 3 minutes. This is a typical example of the type of work this machine is capable of doing in a wide variety of work sizes and weights.

SPECIAL LIBRARIES ASSOCIATION will again present a display of current reference sources and services in Booth No. 431 at the National Metal Congress in Cleveland, October 21-23.

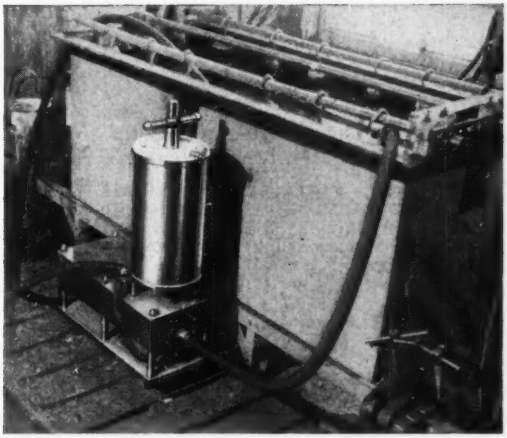
Industrialists, researchers, scientists, and metalworkers are invited to become acquainted with the most recent services and reference books available in this compact working library. The literature specialists in attendance will demonstrate library service on current problems and suggest pertinent sources for requirements in individual fields.

S.L.A. also invites visitors to attend Fall Meeting sessions which center on subjects of primary interest to all concerned in the metals field. In addition to field trips to Battelle Memorial Institute and Warner & Swasey Company, speakers for Thursday and Friday will discuss methods for improvement of reading speed, techniques in report writing, new developments in metals, metal fabrication with particular emphasis on literature sources and operations research as a metallurgical tool.

For the third successive year a Lacquer Information Center will be a feature of the annual Paint Industries Show in Atlantic City's Chalfonte-Haddon Hall, October 27-30.

Here's how to cut your losses

get better finished plated work — save time and labor



The *"Sealed-Disc"* Filter will remove all dirt, dust, and sludge from your plating solutions. You will no longer worry about pitting, spotting, poor adhesion, formation of nodules, etc.

More and more platers testify to the remarkable savings in operating time and labor that the *"Sealed-Disc"* Filter gives them. These cost-minded platers get better finished plated work and have found that their solutions last l o n g e r. *"Sealed-Disc"* Filters, designed to meet plating room requirements, are smaller, more compact and portable, than ordinary conventional filters.

Regardless of the size or type of your installation, there's a *"Sealed-Disc"* Filter to "fit your job". You can depend on a *"Sealed-Disc"* Filter for positive, trouble-free performance that's proof against even the invisible impurities that cause nodules and porousness, proof against losses caused by rejects and reworking. Write for complete details or contact your regular plating supplier.

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We manufacture a full line of Mixers and Agitators covering a complete range of sizes, for mixing, blending, and dissolving. Stainless Steel Mixing Tanks are also available in a wide range of capacities. For full details and illustrations write for your free catalog.

Once again the exhibit is being presented through the cooperative effort of suppliers of raw materials for lacquer and of suppliers of equipment for spraying lacquer. It will depict the latest developments in lacquer technology, formulation, and application.

The companies which are co-sponsors of this year's exhibit are: **THE BAKER CASTOR OIL CO.; CARBIDE AND CARBON CHEMICALS CO.; ENJAY COMPANY, INC.; ANTARA CHEMICALS DIVISION OF GENERAL DYESTUFF CORP.; HERCULES POWDER CO.; SHARPLES, INC.; SHELL CHEMICAL CORP.; BEDE PRODUCTS, INC.; BINKS MANUFACTURING CO.; DUAL-HEET, INC.; THE FOSTORIA PRESSED STEEL CORP.; THE SPEE-FLO COMPANY.**

Technical representatives of the above named companies will be at the exhibit.

Included in the exhibit will be air-dry primers, topcoats, the newest in aerosol lacquers, and lacquer for texture finishes.

The name of the Topper Equipment Company, manufacturer of vapor degreasers and other metal cleaners and solvents, has been changed to the **CIRCO EQUIPMENT COMPANY**, Melville Morris, president, has announced. The company is located at 120 Central Avenue, Clark Township (Rahway), New Jersey.

Equipment produced by the company has previously borne the trade name "Circo," and Mr. Morris explained that the change in company title acknowledges the recognition of Circo products through 30 years of experience in the metal cleaning field. With the name change, both products and company designation will be "Circo."

Besides Circo vapor degreasers, the firm produces metal parts washers and dryers, solvent recovery stills, Circo-Solv (Trichlorethylene) and Per-Solv (Perchlorethylene).

In the past year, the company has also pioneered in the production of equipment for ultrasonic cleaning. The Circosonic ultrasonic degreaser has gained wide interest and acceptance in the metalworking field through its speed and thoroughness in cleaning small metal parts.

Lloyd Portzer, president of **SMOOTH-EX, INC.,** Cleveland, Ohio, has announced the sale of a bright nickel process to the Udylite Research Corp., Detroit.

Smoothex, Inc., will continue its development work on other processes devoting the bulk of its efforts to a bright copper program.

WAGNER BROTHERS EQUIPMENT CO. has acquired a production plant in Wayne, Michigan, where the firm's new fully automatic electroplating machine is in production, according to John D. Tebben, president.

Another section of facilities is being tooled for the manufacture of Wagner Brothers semi-automatic platers, package unit platers, agitators, and anode containers, items to be marketed by Wagner Brothers, Inc., warehouse supplier. The company will soon offer a tank lining service featuring a new type of material.

The new plant is located at 42056 Michigan Ave., Wayne, Michigan.

A government contract totalling nearly a quarter of a million dollars has been awarded to the **DEVILBISS COMPANY** for air compressors to be used in Air Force motor pools and service centers, Howard P. DeVilbiss, president, has revealed.

The compressor contract was received from the Warner Robins Air Force Base, Macon, Ga. The compressors, while embodying some special features, will be built on the regular compressor production lines at DeVilbiss. The company previously had manufactured similar compressors for the armed services during World War II and the defense period following the war.

Recently, DeVilbiss was awarded a contract totalling $30,665 for air compressors to be used in armed forces dental offices. These compressors have fine adjustment features for controlling air volume and the complete unit is designed to keep compressor noise to a minimum.

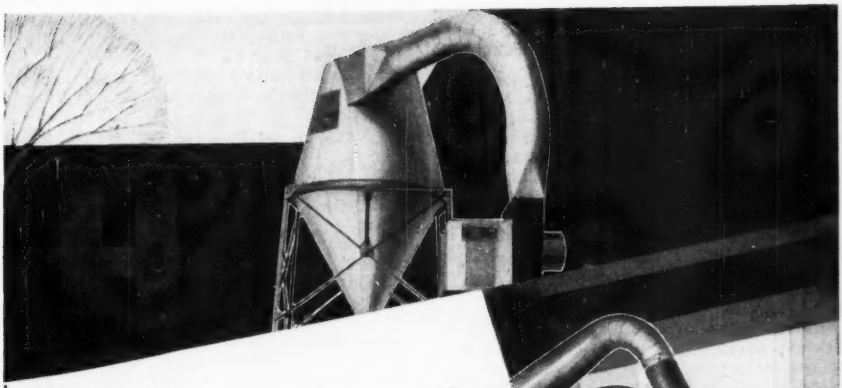
Nearly 650 compressors will be built under the two government contracts.

FREDERIC B. STEVENS, INC., has opened a Customer Service Warehouse in Springfield, Ohio.

Customers in the Ohio area were notified of the contemplated move and, through the use of convenient postage paid return post cards, were given the opportunity to specify items they would like stocked.

Results have clearly indicated the value to Stevens Ohio customers of having a local warehouse for Stevens products.

The warehouse is being operated in conjunction with the Stevens plant in Springfield.



Sewing Machines? Automotive Parts? Electrical Appliances?

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The YOUNG & BERTKE Co.

DUST and FUME CONTROL • OVENS • SPRAY BOOTHS

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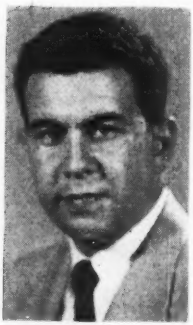
Let Us Modernize Your Present System

NEW POSITIONS

J. ROY GORDON, vice president and general manager of Canadian Operations of The International Nickel Company of Canada, Limited, has been elected a director of the company, it has been announced by Dr. John F. Thompson, chairman of the board of directors of Inco. He succeeds the late R. Leslie Beattie who had been vice president of the company since 1942 and a director since 1943.

RALPH D. PARKER has been elected president of Canadian Nickel Company, Limited, Inco subsidiary which conducts its exploration and prospecting program, it has been announced by J. Roy Gordon, vice president and general manager of Canadian Operations of The International Nickel Company of Canada, Limited. Mr. Parker has been vice president and a director of Canadian Nickel Company, Limited, since May, 1952.



Patrick H. Norton

PATRICK H. NORTON has joined the sales engineering staff of Frederic B. Stevens, Inc., manufacturer of metal finishing equipment and supplies.

He will cover the Stevens western Michigan territory with headquarters in Grand Rapids.

Prior to joining Stevens, Mr. Norton served two years as a counter-intelligence agent with the U. S. Army. He also worked as a field engineer for Brown Instrument Division, Detroit, before being called to active duty.

Mr. Norton is a graduate of University of Detroit with a degree in Mechanical Engineering.

ROMAN C. BENDER has rejoined the metal finishing equipment and supplies sales staff of Frederic B. Stevens, Incorporated. He will cover the state of Indiana and operate from the Stevens Indianapolis Branch at 36 Shelby Street.

Mr. Bender's combined experience, in both the polishing and plating lines, totals over 20 years. Five years of this experience was gained while serving as a Stevens representative immediately following World War II.

He is an active member of the Indianapolis Branch, American Electroplater's Society.

Clay A. Sayers

Cowles Chemical Company, Cleveland, Ohio, has announced the appointment of **CLAY A. SAYERS** as Cowles technical man in the Metal Cleaner Department for the sales territory of Southern Ohio, Indiana and Kentucky.

Clay Sayers is well qualified to give valuable assistance to industrial metal working companies, having had extensive experience in industrial selling and in the polishing and plating fields. Mr. Sayers will make his home at 1981 Seymour Avenue, Cincinnati 37, Ohio.

Joseph A. Sanches

JOSEPH A. SANCHES has been appointed general sales manager of Bede Products, Inc., 1110 Brookpark Road, it has been announced by James A. Bede, president.

A former resident of New York, Mr. Sanches brings with him an outstanding record of accomplishment in the product finishing field. The author of several technical trade journal articles, he has acted as consultant to leaders in the finishing industry. He was plant manager for Epiphone, Inc., world's largest manufacturer of stringed instruments, and for the Century Desk Company.

Mr. Sanches will devote his promotional efforts to the Bede Paint Heater and the Airless Spray Painting System, just introduced to the trade.

SAVE BUFFS, LABOR, COMPOUND

with

NANKERVIS

automatic

COMPOUND APPLICATORS

Completely automatic application of buffing compound using a Nankervis applicator saves in every step of the operation—buffs (proper head of compound), labor (no wheel tender's time), compound (no waste). And, you cut down rejects as well!

Just look at these features of the Nankervis Automatic Applicator!

- **Easy to install—from any angle.**
- **Dirtproof—all moving parts enclosed.**
- **Lightweight—ideal for floating heads.**
- **Adjustable feed rate—variable from .0015 to .015 per strike.**
- **Accommodates cakes up to 24" long.**
- **Operates on 110v single phase, 220 or 440v three phase.**

And, remember, automatic application of bar compound is cleaner, too.
Send for Bulletin M-14, today.

GEORGE L. NANKERVIS COMPANY

metal-finishing equipment

19255 W. Davison Avenue • Detroit 23, Michigan

(Left to right) Thomas M. Rodgers, Frank W. Mountain, Howard L. Wright, O. K. Irgens

Hanson - Van Winkle - Munning Co., manufacturer of plating and polishing equipment and supplies, has announced three new appointments of sales representatives for territories along the middle and southeastern seaboard. **HOWARD L. WRIGHT** will cover the Philadelphia area, southwestern New Jersey and easternmost Pennsylvania. Assisting him will be **FRANK W. MOUNTAIN. THOMAS M. RODGERS** takes over territory south of Wilmington.

Mr. Wright will be district manager with headquarters in Philadelphia. With H-VW-M for seven years, he has previously covered Pennsylvania, New York and states in the Southeast. He is a graduate of Franklin & Marshall, spent four years in the U. S. Navy during World War II

Mr. Mountain moves to his new position after receiving a year's training in the company's laboratory at Matawan. He is a graduate of Colgate University.

Mr. Rodgers, whose headquarters will be in Baltimore, moves South after representing H-VW-M for the past six years in eastern Pennsylvania. He is a past president of the Philadelphia Branch of the American Electroplaters' Society, a member of the Electrochemical Society, American Society for Metals and is a registered professional chemical engineer in the state of Pennsylvania. He attended the University of Pennsylvania and Swarthmore College, and served as a Naval Reserve officer for five and one-half years during World War II.

The appointment of **O. K. IRGENS** as development and service chemist in the cleaner department has been announced.

Mr. Irgens joins H-VW-M from Nopco Chemical Company where he was technical service and development chemist in the company's metal-working division. He formerly worked with Esselen Research Corporation for five years, and Remington Arms Company as chief chemist of the Lake City Ordnance Plant.

He is a graduate of North Carolina State, B.S. is chemistry.

The appointment of **HENRY G. ZUCKER, JR.**, as sales representative in the Chicago area has been announced.

Henry G. Zucker, Jr

Mr. Zucker, who is a graduate of Lafayette College, received extensive technical training at the Hanson-Van Winkle - Munning laboratory following his graduation in 1949. He received additional training in sales at Matawan prior to his transfer to Chicago.

Following a recent meeting of the board of directors of Oakite Products, Inc., manufacturer of industrial cleaning and allied materials, three changes in the management organization were announced. **J. J. BASCH**, former Philadelphia division manager and veteran of 28 years service with the company, was appointed manager of research and product development. He will be in charge of the company's technical research program, and will supervise the field testing of new experimental materials. A member of the company's board of directors since 1948,

Gleaming

Beauty — in products as in people — is sometimes a special "glow" that seems to come from within, to cast its radiance upon all who see. And such is the beauty of a truly fine product, built to exacting standards and finished with a coating created for that product alone. Manufacturers wisely seek that beauty for their own quality merchandise, by turning to specialists for help. Within our laboratory, a complete staff of experts is constantly at work developing individualized finishes for a wide variety of manufactured items. We invite you to submit samples of your own products for recommendation.

Research, Quality, Service

ROCKFORD VARNISH *Company*
ROCKFORD, ILLINOIS

Manufacturers of Protective and Decorative Coatings

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GORDON BARTELS CO.
Roller Coating Specialists

he has also been elected a member of its executive committee.

At the same meeting, **E. H. STEIF**, general attorney of the company and member of the Oakite organization since 1948, was appointed assistant secretary and elected to the board of directors.

Another appointment announced was that of **W. A. BALTZELL**, former southern division manager and with the company since 1941, as assistant sales manager. He will assist the general sales manager of the company's industrial division.

P. Peter Kovatis

P. PETER KOVATIS of Hartford, Conn., was named to the post of Executive Secretary by the A.E.S. Executive Board according to an announcement made by president George P. Swift. The new Executive Secretary assumed his duties on August 1 and came to A.E.S. with more than 10 years' experience in the public relations and administrative fields. For the last two years he was public relations director and director of membership promotion at one of the East Coast's largest non-profit institutions in Hartford where he was cited recently for achieving "one of the best records in a decade."

He is a graduate of Boston University at which institution he matriculated in the College of Business Administration and School of Public Relations and Communications. He holds a Bachelor of Science degree in public relations.

A World War II veteran with two years' service in Field Artillery and almost three years in the Air Force, Mr. Kovatis rose from private to Captain. He was Executive Officer, Personnel Officer, Adjutant, Trial Judge Advocate, Unit Historian, Public Relations Officer and Statistical Officer. He served with the 14th Air Force "Flying Tigers" in China and holds commendations for "directing the most efficient administrative units in the China Theater."

DR. D. GARDNER FOULKE, who resigned as Executive Secretary to take over his new duties as manager of electrochemical development for the Hanson-Van Winkle-Munning Company, will be in charge of the laboratory phase of research in electroplating and metal finishing there. Prior to serving as executive Secretary of the Society, Don Foulke was chief chemist for H-VW-M. He is a graduate of Juniata College and Rutgers University.

Jack E. Lawson

The appointment of **JACK E. LAWSON** to head sales of Circo vapor degreasers and other Circo metal cleaning products in the Detroit area has been announced by Melville Morris, president of the Circo Equipment Company (formerly Topper), 120 Central Avenue, Clark Township (Rahway), New Jersey.

Mr. Lawson has specialized in this field in the Detroit area for approximately 20 years. In this career, he is credited with selling more degreasers and trichlorethylene than any other individual, and is considered a national authority on metal cleaning.

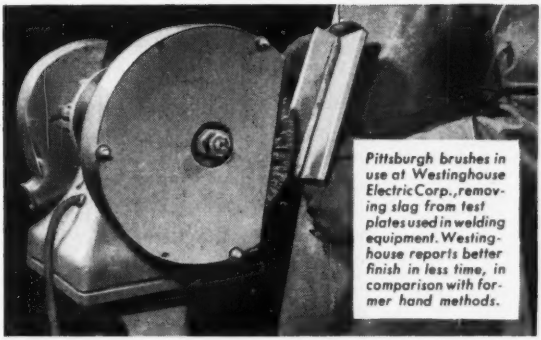
Graduated from the University of Detroit with a mechanical engineering degree, Mr. Lawson first entered the degreasing field as a designer and engineer in 1933. He entered the sales field a year later and has been in sales work since that time. He is a member of the Engineering Society of Detroit. Mr. Lawson will be located at Circo's Detroit office, 18032 James Couzens Highway, Detroit 35, Michigan.

MEETINGS

The **NATIONAL FEDERATION OF METAL FINISHERS** wil hold a **DIRECTORS' MEETING** and **GENERAL MEETING** open to job shop operations on Saturday, October 17, in the Hotel Sinton, Cincinnati, Ohio. The theme of the meeting has been built around improved job shop operation. Talks on problems of job shop management will be given by NFMF leaders, and various phases of Federation activities and services will be discussed. The program is as follows:

"Monthly Comparative Business Surveys and How They Work,"

Replace hand finishing with power-driven PITTSBURGH BRUSHES for



Pittsburgh brushes in use at Westinghouse Electric Corp., removing slag from test plates used in welding equipment. Westinghouse reports better finish in less time, in comparison with former hand methods.

• Better Cleaning • Fewer Rejects • Lower Labor Costs

—as these companies did:

Removal of imbedded slag in welding test plates formerly was done by hand at the Westinghouse Electric Corp., Trafford, Pa., using a wire brush and welder's hammer. Pittsburgh brushes, powered by a direct-drive ½ h.p. motor, now remove more slag in less time, and produce a better finish. In addition, Westinghouse reports their Pittsburgh brushes "stand up better than average in use."

Complete cleaning of dried concrete, rust and scale from steel frames used in concrete forming is essential prior to re-using the forms. Pittsburgh wire brushes were installed at the Universal Form Clamp Co., Chicago. Working on a conveyor-fed machine, the Pittsburgh brushes now remove all foreign material at a rate of 50 pieces per hour, replacing former laborious hand brushing and scraping.

De-scaling preheated bar stock at the Dominion Forge & Stamping Co., Ltd., Canada, was formerly done by hand scraping. This never did a complete job, and inclusions resulted which produced defective forgings. Pittsburgh brushes, on specially-designed machines, now do the job, and have "increased efficiency, decreased the amount of scrap, improved work quality, and saved labor."

WRITE TODAY FOR FREE BOOKLET!

Write today for a free copy of our booklet that shows, through actual case histories, how Pittsburgh cuts brushing costs. Address: PITTSBURGH PLATE GLASS Co., *Brush Div.*, Dept. W-8, 3221 Frederick Ave., Baltimore 29, Md.

PITTSBURGH *Power Driven* **BRUSHES**

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PITTSBURGH PLATE GLASS COMPANY

IN CANADA: CANADIAN PITTSBURGH INDUSTRIES LIMITED

Frank Kaiser, Masters' Electroplating Association, New York City.

"Annual Wage Surveys and How They Benefit the Job Shop Operator in Contract Negotiations and in Keeping Abreast of Industry and Area Rates,"
Carl F. Hansen, Chicago Electro-Platers Institute.

"Company Initiated Group Insurance Programs and How They Can Save You Money,"
J. Robert Greenwell, Chicago Electro-Platers Institute.

"Publishing an Association Membership Directory and How It Builds Sales for the Metal Finisher,"
Lawrence J. Hay, Chairman, Chicago Electro-Platers Institute.

REPRINTS AVAILABLE

A limited number of reprints of the following articles from PRODUCTS FINISHING are available to readers. There is no charge for this service.

"Chemical Surface Treatment Extends the Durability of KoolVent All-Weather Aluminum Awnings,"
by Norman P. Gentieu,
American Chemical Paint Company, Ambler, Pa.

"Finishing Floor Registers and Grilles at The Auer Register Company,"
by Ezra A. Blount, Editor

"Filter Out Your Plating Rejects,"
by Ezra A. Blount, Editor

"Finishing Refrigerators with Hot Sprayed Enamel,"
by Frank L. Bonem

"Hub Caps Plated and Enameled in Conveyorized Setup,"

"Plan Your Finishing Facilities and Operations,"
by Thomas J. Menzel,
Jack S. Steele Co., Philadelphia, Pa.

"Hot Spray Finishing of Machine Tools,"
by Roy W. Hill,
Besly-Welles Corporation

PRODUCTS FINISHING
431 Main Street, Cincinnati 2, Ohio.

Lawrence J. Hay, Chairman, Chicago Electro-Platers Institute

Phil Ranno, Chairman, National Federation of Metal Finishers

"Collective Bargaining Through Trade Association Auspices,"
Phil Ranno, Chairman, National Federation of Metal Finishers.

"Legal Services and Government Relations for the Job Shop Association,"
L. M. Glassner, executive secretary, Chicago Electro-Platers Institute.

"Technical Problems of the Metal Finishing Industry at the Management Level,"
S. C. Taormina, executive secretary, Masters' Electroplating Association, New York City.

Representatives of the job plating industry from New York, Buffalo, Philadelphia, Chicago, and St. Louis will be present at this Federation meeting. All job finishing shop owners and managers in the Cincinnati area, as well as nearby cities, are invited to attend.

The meeting will be preceded by a luncheon to be held at 12:30 P.M. in the Rookwood Room, Hotel Sinton. Reservations for the luncheon may be made by contacting L. M. Glassner, executive secretary, Chicago Electro-Platers Institute, 35 East Wacker Drive, Chicago 1, Ill.

NECROLOGY

A. ALBERT KLEIN, assistant director of research and development at Norton Company, Worcester, Mass., and one of the country's leading authorities on abrasives, died suddenly at his home August 25. He was 64 years old.

Mr. Klein graduated from the University of Michigan in 1911 and after graduation worked as assistant physicist at the U. S. Bureau of Standards until 1916

when he came to Norton. He has served as petrographer, head of the microscopic section, and research engineer. He has held his most recent position for the past 10 years.

During his 37 years with Norton, Mr. Klein was responsible, in part at least, for all improvements in Norton abrasive grains developed during the past 30 years. He also did much work in the thermal analysis of feldspar, grain coatings for polishing abrasives, Norbide (Norton boron carbide) and the application of X-Ray spectroscopy to the abrasive industry. He was a member and secretary of Norton's Abrasive Technical Committee which governs all development work on abrasives.

In addition to his contributions to the abrasive industry, Mr. Klein was very active in civic affairs.

J. J. SIEFEN, president of the J. J. Siefen Company, Detroit, died on August 23, 1953, at his home in Detroit at the age of 78.

Mr. Siefen formed the company bearing his name in 1927 as a jobber of plating and polishing supplies and equipment. He learned his trade in Germany and after coming to this country at the age of 16, became foreman of a brass plating shop at 19. Thereafter followed years as supervisor, factory manager and general manager in various finishing factories until 1927.

Mr. Siefen was active in the business until shortly before his death. He had changed it into a manufacturing concern of buffing and polishing materials, the most noted development being the successful practice of spraying buffing and polishing compounds.

He was a member of the Detroit Branch of the American Electroplaters' Society.

meetings OF INTEREST TO FINISHERS

Oct. 17. Director's Meeting and General Meeting, National Federation of Metal Finishers, Hotel Sinton, Cincinnati, Ohio.

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CLEAR COATINGS

Who's Who* In American Industry have used AGATEEN Clear Coatings for a Quarter of a Century.

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THE LAST WORD IN QUALITY

Oct. 19-23. 35th National Metal Exposition and Congress, American Society for Metals, Cleveland Public Auditorium, Cleveland, Ohio.

Oct. 19-23. 41st National Safety Congress and Exposition, National Safety Council, Chicago, Ill. Sessions on industrial safety at Conrad Hilton, Congress, Morrison, and Hamilton hotels.

Oct. 26-27. Eleventh Annual Convention, National Association of Suggestion Systems, William Penn Hotel, Pittsburgh, Pa.

Oct. 26-28. 65th Annual Convention, National Paint, Varnish and Lacquer Association, Chalfonte-Haddon Hall, Atlantic City, N. J. For reservations write Paint Industry Convention Bureau, 16 Central Pier, Atlantic City, N. J.

Oct. 27-31. 31st Annual Meeting of the Federation of Paint and Varnish Production Clubs, Chalfonte-Haddon Hall, Atlantic City, N. J.

Nov. 30-Dec. 5. 24th Biennial Chemical Industries Show, Commercial Museum and Convention Hall, Philadelphia, Pa.

Jul. 12-15, 1954. 41st Annual Convention, American Electroplaters' Society, New York City.

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FOR SALE—One Direct Gas Fired, single compartment continuous conveyor type oven with forced circulation. Overall length of conveyor 44 ft. Production capacity approximately 3300 lbs. Aluminum sheets per hour. Maximum operating temperature 600° F. Upon request we will be glad to send you full information and a picture.

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WANTED—Experienced paint roller coating machine operator for Enamel Development Laboratory work. Liberal insurance, hospitalization and pension plan. Will work in new Laboratory now under construction. Contact Personnel Manager, American-Marietta Company, 901 North Greenwood Avenue, Kankakee, Illinois.

Wanted: Used filter for nickel plating and/or copper plating solutions. Minimum 7 square foot area. Contact Hammer, 686 North Robertson, Los Angeles 46.

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You'll find a Bias Sisalweev ideal for heavy cutting down of drawn, stamped, or cast ferrous and non-ferrous articles. You can use it at high or low speeds—it's impossible to scorch at any speed or pressure. And, it's ventilated —24 air channels give extra cooling.

Bias Sisalweev is supplied either treated or untreated, but we recommend the exclusive H-VW-M HC, (heavy cut) treatment. This not only increases the rate of cut, but lengthens wear life and power to hold composition. And for buffing steel, you can't beat the combination of a Bias Sisalweev and H-VW-M 6-B-97 composition for heavy cut or 6-B-66 for medium cut with finer finish.

Bias Sisalweev is just one of many results of over eighty years of constant electro-plating and polishing development — a continuing policy summed up in H-VW-M Platemanship . . . your working guarantee of the best that industry has to offer not only in brushes and buffs—but in every phase of plating and polishing.

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PLATEMANSHIP

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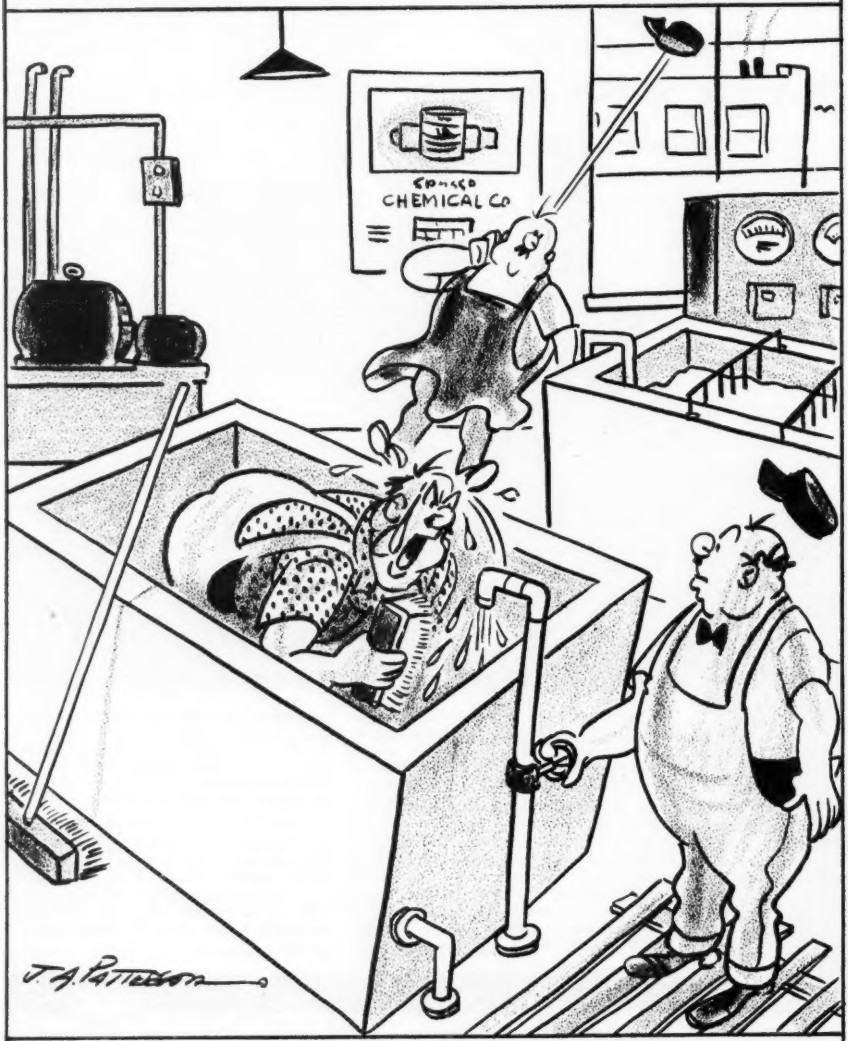

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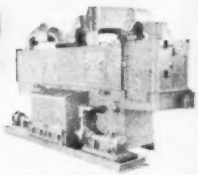

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